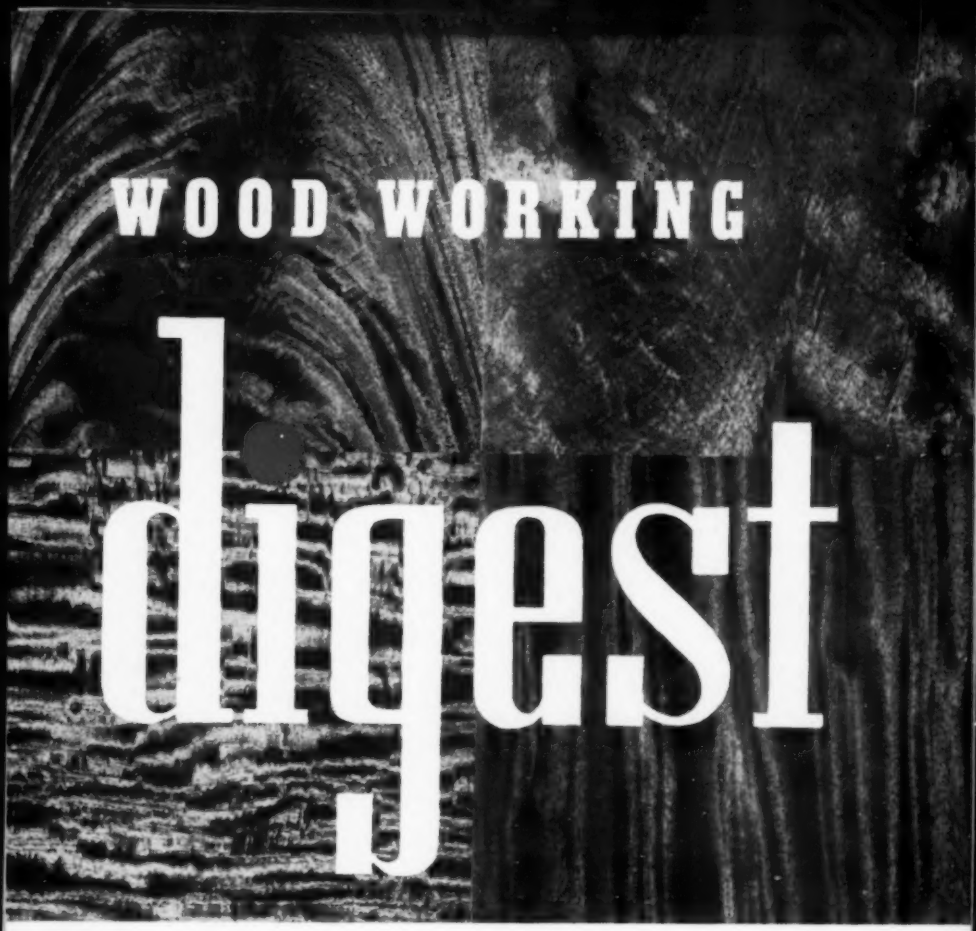

# WOOD WORKING digest

A Hitchcock Publication


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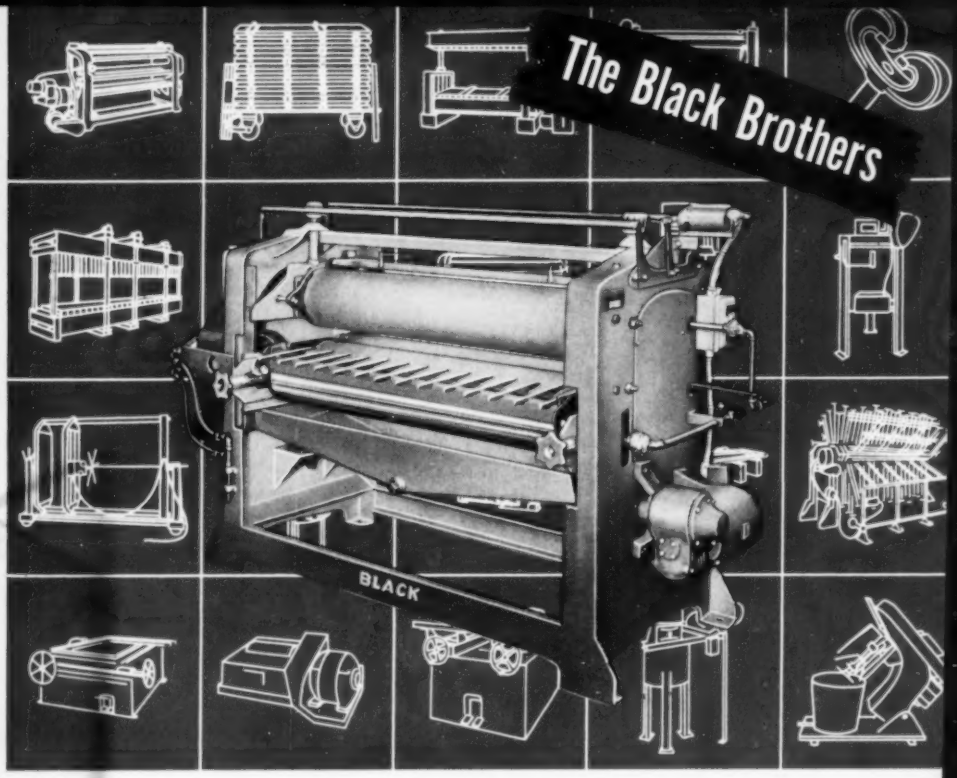



# A Complete Line of Laminating & Gluing Equipmer

Black Brothers manufacture a complete line of laminating and gluing equipment of nationally recognized superiority. Illustrated above is a No. 22-D resilient roll, ball bearing glue spreader equipped with water cooled doctor rolls as an optional extra for use with quick setting glues. Gluing rolls are deeply covered with fine synthetic rubber, and are specially grooved to control the amount of resins deposited and to conform to irregularities in the veneer. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Black's 22-D Spreader for resins, casein, and other cold glues is unmatched in speed, economy, accuracy, cleanliness and quality production. Write for details today . . . or let us send you a catalog on the complete Black line.

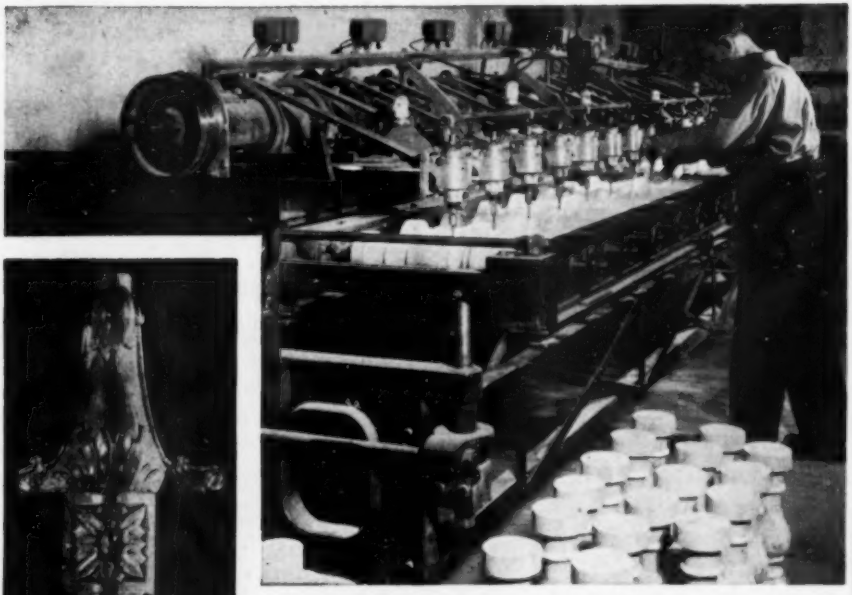
***"If It is Gluing Equipment—We Have It"***

**THE BLACK BROTHERS CO., Inc.**

**Mendota, Illinois**

# "OLIVER"

## MULTIPLE SPINDLE CARVING MACHINES

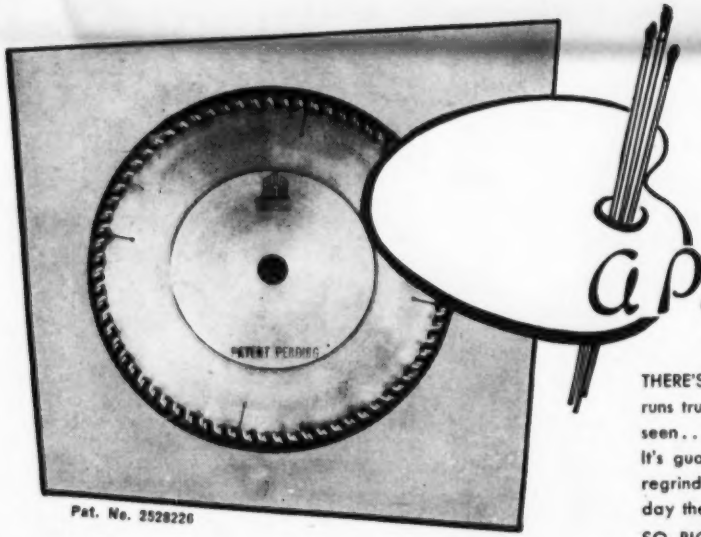


### Beautiful carvings, accurately cut—
### half rights and half lefts, if desired

It takes a good man to tell the original from the duplicate carved on the "Oliver." The low unit cost explains why leading furniture plants operate from one to nine of these machines for flat back, round and odd shapes. Table remains stationary while the spindles cut carvings up to 54 inches long without resetting. Rounded stock is turned simultaneously for uniform accuracy. Reverse cutting attachment enables you to use one pattern to carve both right and left hand work. The constant, powerful drive of the spindles makes heavy cuts at top speed. Easy to operate and set up. Made in sizes of 4 to 32 spindles. *Write for Bulletin* 308.

**OLIVER MACHINERY COMPANY**

***Established 1890*** **GRAND RAPIDS 2, MICHIGAN**

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# A Perfect Work Of Art

YOU DON'T HAVE TO BE an art critic to know that a Big Four carbide tipped blade is a perfect work of art. You may not be interested in what this revolutionary blade has done for others, but you *should* know what it can do for you.

IF YOU HAVE chip-out trouble, if blades over-heat or if distortion plagues you; if your blades fail to duplicate after regrinding, if you get poor factory service and are charged excessively for regrinding; if you're forced to use costly jointing prior to glueing, or if any other problem irritates you then we know you are NOT a Big Four user.

THERE'S NO DISTORTION because it's non-tensioned . . . blade runs true at any speed. It's the smoothest cutting saw you've ever seen . . . there are no chipouts to mar its perfect, smoothly cut edge. It's guaranteed to duplicate its perfect performance after every regrind. On regrinds, blades are ground and returned the same day they are received.

SO, BIG FOUR IS NOT just another saw . . . stamped out and carbide tipped. Instead, it is carefully *turned* out of steel, precision fitted and designed for your job. This effort on our part guarantees you perfect peformance in any cutting operation. Yes, a Big Four blade is a perfect work of art.

FREE LITERATURE will be sent you upon request. Write today: Big Four Carbide Tool Co., Dept. SL-1, 5938 Carthage Ave., Cincinnati 12, O.

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**BIG FOUR CARBIDE TOOL COMPANY**

5902 CARTHAGE AVENUE • CINCINNATI 12, OHIO

## You Can't Afford to Miss with Green Lumber!

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With today's high operating costs and sky-high taxes, the extent of your plant's profits largely depends on how much you can increase your volume through greater operating efficiencies. Successful men in the woodworking industry are taking full advantage of *the quickest way to increase production and the surest way they can protect themselves against costly waste and green lumber rejects . . .* STANDARD DRY KILNS!

**SAFEGUARD *YOUR* PROFITS, TOO!** Let Standard remodel your old, natural draft installations or recommend the new kiln installation you need to increase your volume and eliminate losses.

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*Manufacturers of Internal Fan Kilns*

*Write for illustrated Standard Catalog.*

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P. O. BOX 5708 • INDIANAPOLIS, INDIANA

**$395. F.O.B. FACTORY**

**TABLE $195.00 EXTRA**

**WRITE FOR FREE FOLDER**

**Beach Swing Cut-Off Saw shown above is popular Model #605 furnished with built-in 5 horsepower electric motor. Also available with 3, 7½ and 10 horsepower motors. All machines are self-contained units of Steel construction. Swinging arm is mounted on ball bearings and has vertical adjustment of 2".**

# BEACH

**MANUFACTURING CO. • MONTROSE, PA.**

# Wood Working Digest

**MAY, 1951 — OUR FIFTY-THIRD YEAR**


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cleans up in a jiffy!

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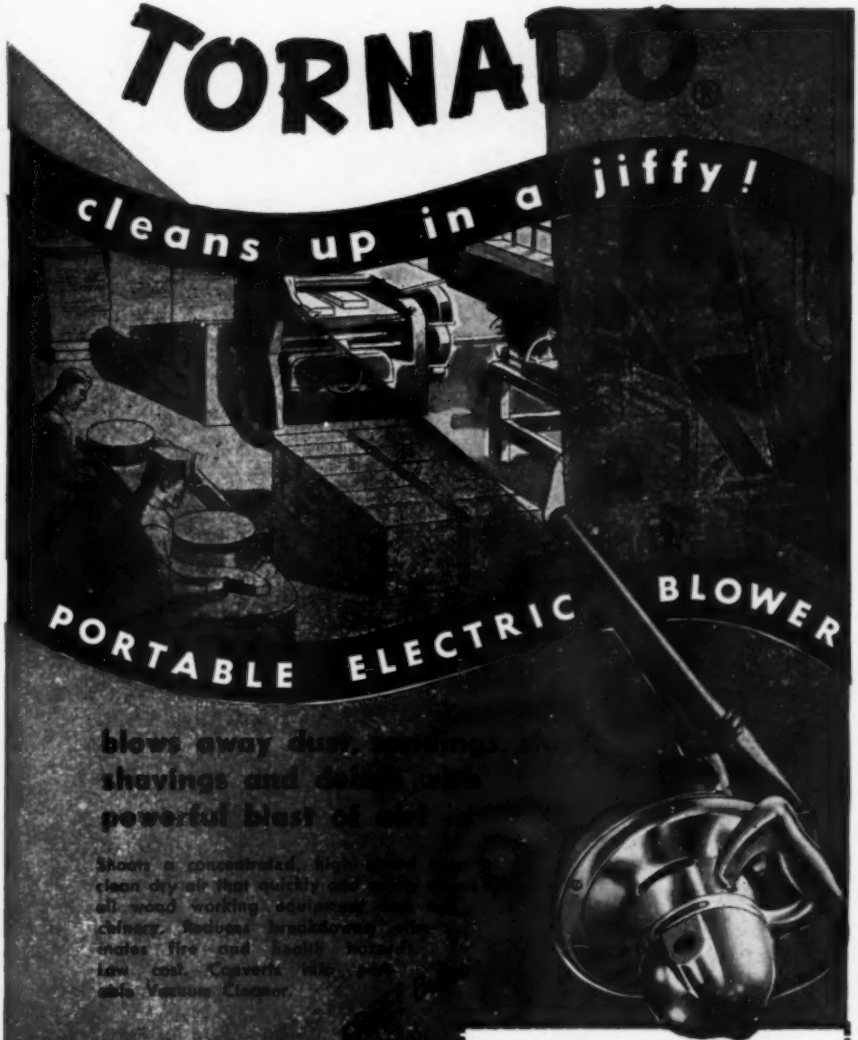

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DOIG NO. 45-20-16

**NEW FEATURES**

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This is a small scale (highly stylized) model of a typical Walters Rough Mill. There are 13 men shown operating this complete mill. Not shown are the 8 men released for profitable use elsewhere in this plant by the Walters System of Conveyors.

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BE PROFIT-WISE . . . CONVEYORIZE

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Please send me a copy of your 22" x 34" fully detailed, self-explanatory model drawing of a typical Walters Rough Mill.

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| Lift Installed at | Production Increase |
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| Double Surfacers | 40% to 75% |
| Rip Saws | 30% to 60% |
| Cut-Off Saws | 20% to 50% |
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A glance at the above figures, FURNISHED BY USERS, proves how Leitelt Lumber Lifts increase production.

You can get these profitable increases in production and save the labor costs of one or two men with a Leitelt Lumber Lift in your plant or yard. Leitelt Lumber Lifts are built in a full range of capacities for handling loads from three to thirty tons easily and safely.

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## LEITELT IRON WORKS

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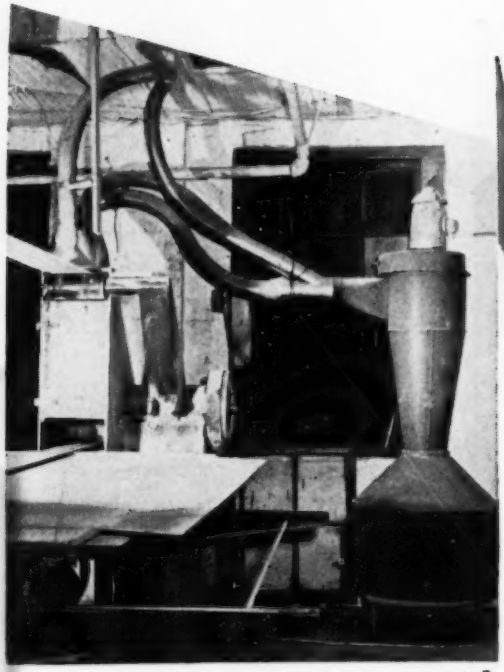

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# TORIT DUST SEPARATOR

## gets around to get results

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**SOLUTION:** A Torit 19-FM Dust Separator, with special piping and hooding set ups. There are three pipe connections, one at the bottom of the hood, a second at the top, and the third connected to a fume type hood which *sweeps up* particles that may have been missed by the first two. Note, too, the extra large storage reservoir beneath this Torit Dust Separator, and how the entire unit is set so it will not interfere with movement of the panels.

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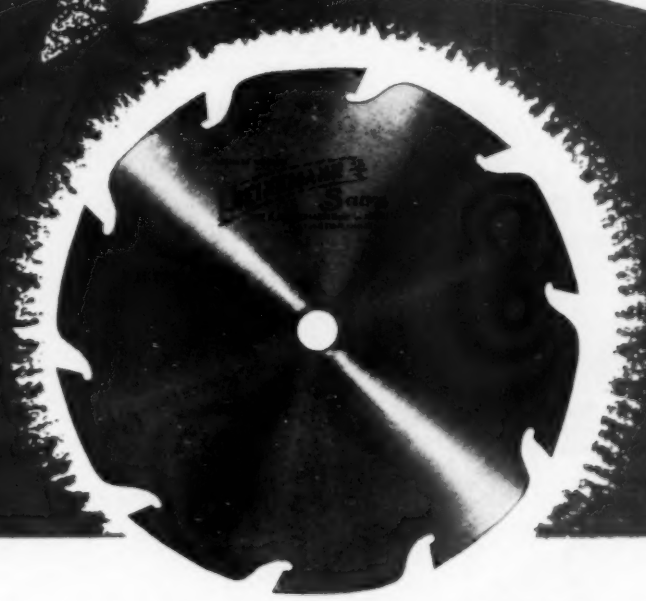

***SAFE—NO KICK-BACK—LESS POWER REQUIRED***

**FOR EFFICIENT RIPPING, CROSS CUTTING AND MITERING**

## Coarse Tooth ★ Fast Cutting

This saw designed by Saw Engineers for fast and efficient sawing in all kinds of lumber and plywood. Easily resharpened—Not necessary to buy expensive resharpening gadgets.

For Bench—Radial—Electric Hand Saws.

Available in the following diameters and number of teeth with all standard bore sizes.

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|---|---|---|---|
| 6" | 6 | 12" | 12 |
| 7" | 8 | 14" | 14 |
| 8" | 10 | 16" | 16 |
| 10" | 10 | | |

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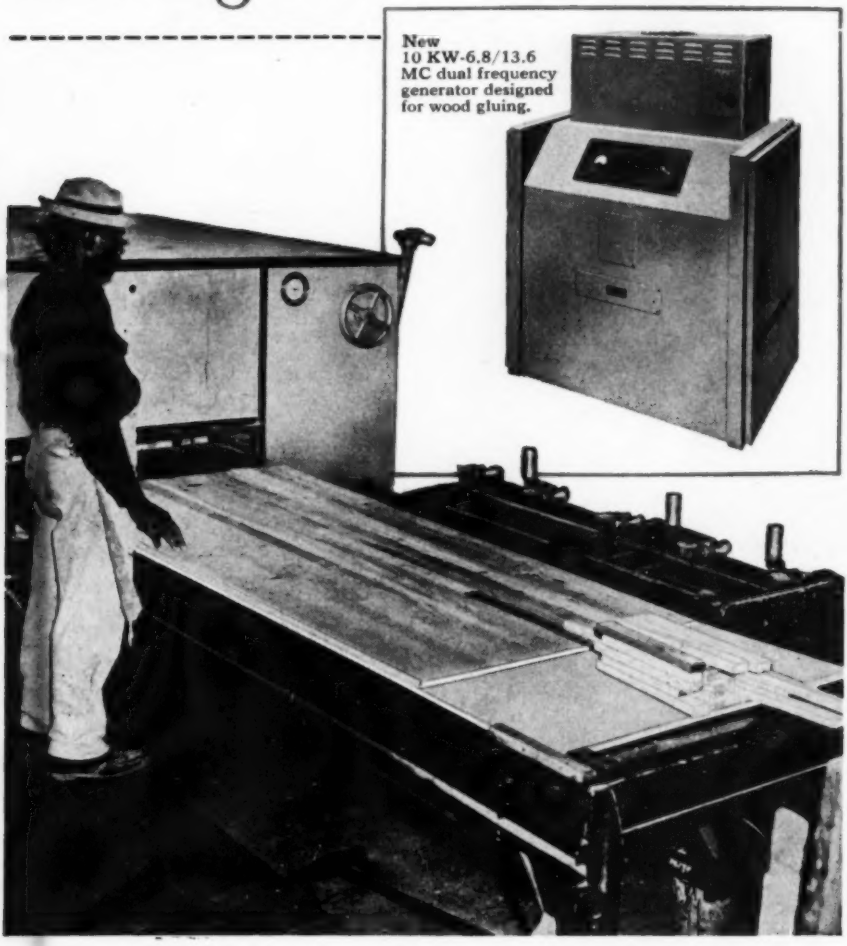
YOU CAN BE SURE... IF IT'S

# Westinghouse




A Westinghouse 10KW-5 MC generator and a Weldon-Flinchbaugh panel press produce phenomenal savings in costs and materials at Bradley Plywood Co.

# Part-Time SAVINGS

# $26,000

# A YEAR!

RF gluing equipment is used in new, efficient and productive ways by Bradley Plywood Company, Savannah, Georgia. For one day a week Bradley's RF equipment glues scrap wood salvaged by them to make lumber core panels, desk-top cores and other items.

*On scrap-wood gluing alone, Bradley saves $26,000 a year!*

Bradley spends the other four days a week on RF gluing of core-stock panels from standard size lumber. With RF heating, production has tripled, costs have been halved.

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Today, scarcities demand savings. For savings information, call your Westinghouse representative. Or write Westinghouse Electric Corporation, Department W-3, 2519 Wilkens Avenue, Baltimore 3, Maryland; ask for the booklet B3946B covering *"RF Heating for the Woodworking Industry."*

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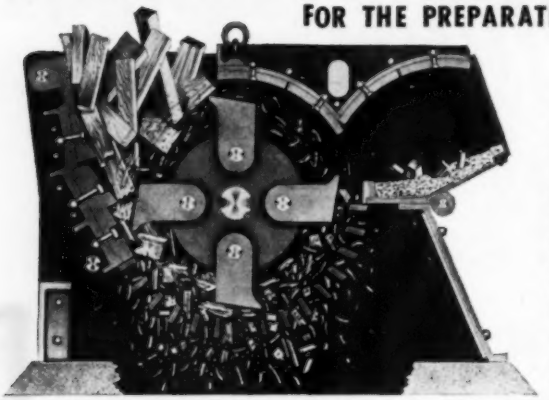
# WILLIAMS "NO-NIFE" HOGS

## FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

## ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

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WC81-2

## CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
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Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

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CRUSHERS GRINDERS SHREDDERS

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- 7-1/2 or 10 HP Cutterhead Motor
- Feed Indicator
- Finger-tip Controls

It has such features as — continuously supported bed on long incline wedges for maintaining accuracy for the life of the planer, 4-Knife Round Cutter Head, Whitney Standard Knife Grinder, one-piece cast base and sash for added rigidity, gear train, all enclosed but easily accessible, simplified adjustments, small floor space (5' x 5'). Write today for complete details. Ask for bulletin D5.

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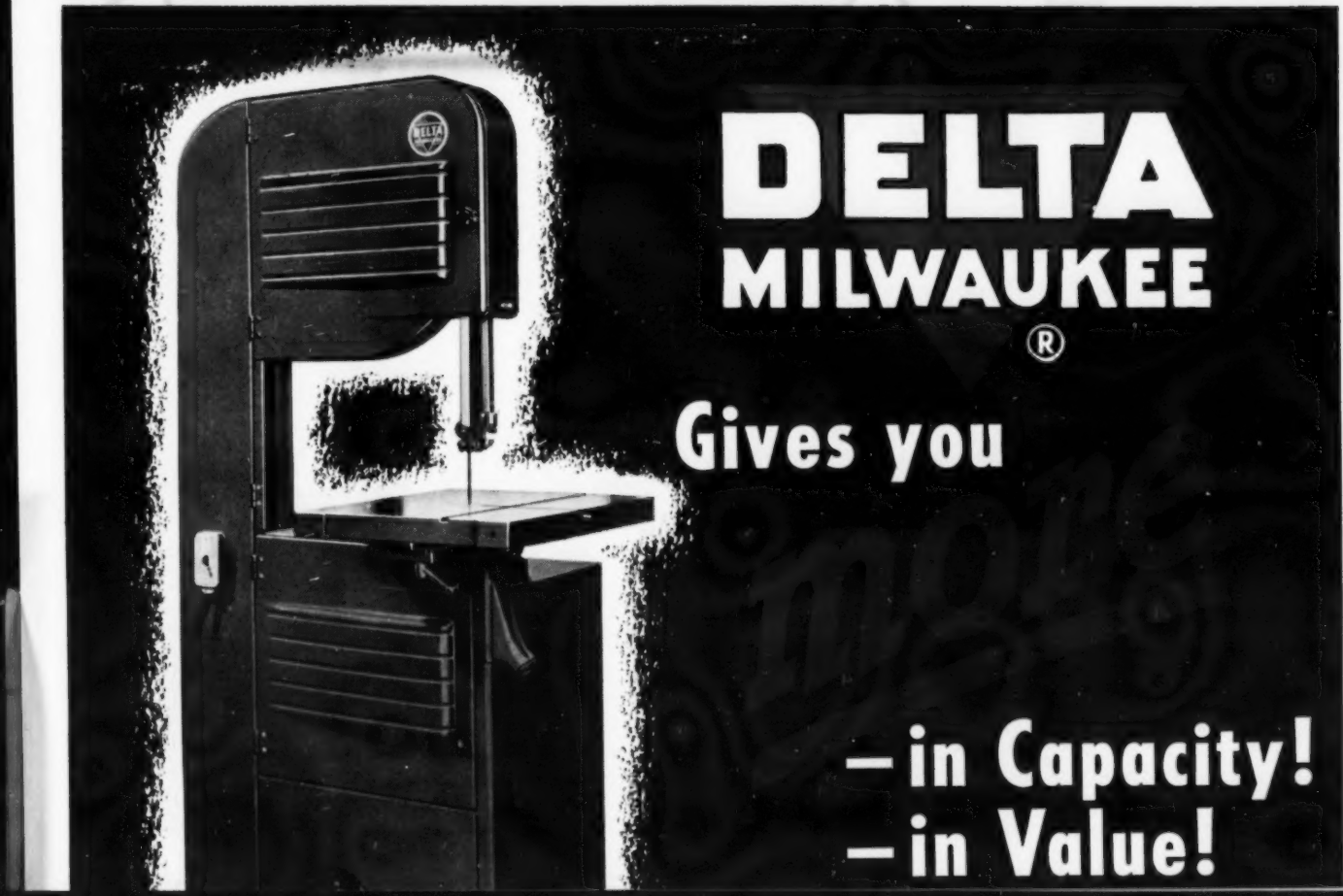
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Gives you
– in Capacity!
– in Value!

# DELTA 20" BAND SAW

Talk about capacity! This Delta Band Saw takes stock up to 1" wide. Handles 13¾" under upper guide, 20" center of 40" panel. Saws plastics and soft metals as well as wood. Has big 20 3/16" x 24¼" tilting table.

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are available on easy time payments.
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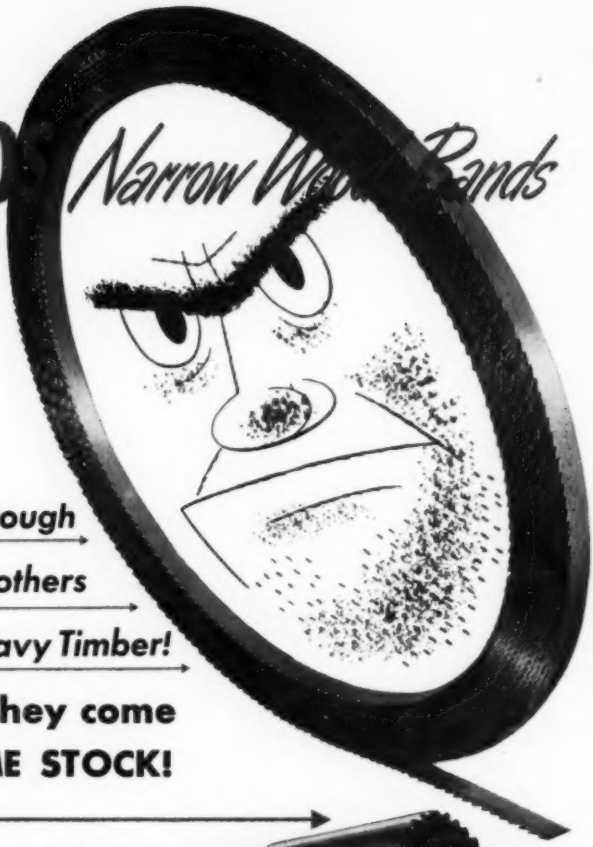
# SIMONDS *Narrow Wide Bands*



***They're just as tough***

***as their Big Brothers***

***who cut the Heavy Timber!***

**. . . because they come from the SAME STOCK!**

*Yes, Simonds Narrow Bands are made of the selfsame, supertough steel* . . . from Simonds' own steel mills . . . *that's used in making the big Wide Band Head Saws.* That's the first extra you get.

And you get many other Simonds *"special extras,"* too: Accurate set on *points* of teeth *only*, to guarantee smoother cut . . . Cold rolling to exactly uniform thickness prevents vibration . . . Back of saw is rounded to reduce friction on guides, preventing cracks from case-hardening . . . Gullets are filed round by special round-edged Simonds Narrow Band Saw Files, avoiding the cracks that start in sharp-angled corners.

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**SAW AND STEEL CO.**
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*Branch Offices in Boston, Chicago, San Francisco and Portland, Ore. Canadian Factory in Montreal, Que.*

*Announcing* **BOICE-CRANE'S**

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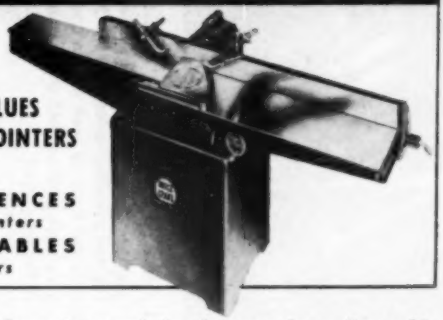

**THE BIGGEST VALUES IN 6" AND 8" JOINTERS**

•

**THE LONGEST FENCES**
*of any 6" or 8" Jointers*
**THE LONGEST TABLES**
*of any 8" Jointers*

Rugged enough for planing mills. Accurate enough for the most demanding cabinet makers.

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Permits strength, permanent accuracy and alignment impossible with bolted-up cast iron construction.

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A cast iron jointer comparable all ways to Boice-Crane's new jointers would weigh more than twice as much.

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Tables undergirded full length.

## THE ENTIRE INFEED TABLE A RABBET ARM

The first jointers with adequate support for narrow rabbetting on wide stock.

## TABLES GROUND FLAT, STAY FLAT

Both tables are simultaneously ground flat and parallel to closest limits.

## QUICK, POSITIVE, MICROMETER-ACCURATE KNIFE SETTING. FINISHES BETTER—OPERATES SMOOTHER

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3¼-inch diameter head (3⅜-inch cutting circle), 20% larger than conventional 6-inch jointers.

## NEW ROTOR-ON-CUTTERHEAD OR V-BELT DRIVE OPTIONAL

***BOICE-CRANE NOW OFFERS THE FOLLOWING COMPLETE LINE OF JOB-RATED JOINTERS—***

| Model No. | Size | Without auxiliary feeding aids, recommended for Stock lengths to | Length being a factor, recommended for stock sizes to | Planes boards and panels to |
|---|---|---|---|---|
| 3400 | 8" x 84" | 8 ft. | 8" x 8" | 16 in. wide |
| 2400 | 6" x 60" | 6 ft. | 6" x 6" | 12 in. wide |
| 1400 | 6" x 36" | 4 ft. | 4" x 6" | 12 in. wide |

## THE ONLY LONG-TABLE JOINTERS AT ANY PRICE, WITH FULL-LENGTH, FRONT-ADJUSTING, DOUBLE-LOCKED FENCES

After the fence has been double-locked, depth adjustment is made without disturbing the locked fence.

## ALL CONTROLS CONVENIENTLY GROUPED AT FRONT. DESIGNED FOR WORKING COMFORT

The depth of cut control, two table locks, direct reading depth scale and switch can be easily used in a comfortable, normal operating position.

## CONVENIENT GUARD—ANOTHER BOICE-CRANE EXCLUSIVE

When rabbetting, guard stays right on the machine—simply turn and swing out of the way.

**Use coupon to obtain further details.**

**BOICE-CRANE CO.**

**931 Central Avenue  Toledo 6, Ohio**

*Please send free literature on the new Boice-Crane Jointers.*

NAME.....

FIRM.....

STREET.....

CITY & STATE.....

# Borden's GLUE News

New glues and improvements in woodworking to help you speed production and cut costs

## HOW TO BID FOR U. S. DEFENSE CONTRACTS

For detailed data on how to qualify in selling wood products to the government, write for free CASCO Service Bulletin 82. It gives the complete story, in six concise pages, covering purchasing offices, obtaining bid invitations, estimating glue costs, military specifications and recommended glues to comply.

## FREE AID IN OBTAINING SUB-CONTRACTS FOR WOOD PRODUCTS

To help woodworkers contribute fully to the defense effort, Borden's Chemical Division has volunteered to serve as "clearing house" for contracts between suppliers

If the glue in the cup does not harden in the usual length of time (due to cold weather, heat failure, lack of catalyst, improper catalyst, etc.), the corresponding bale should be kept intact until the glue sample finally hardens. This prevents loss of panels due to incomplete cure.

### How to salvage under-cured panels

Unnecessary losses are often taken on panels when bales are torn down before the glue is completely cured. In many cases, these panels can be saved.

1. If only 1 or 2 bales have been opened, leave the others under pressure longer and increase curing temperature, if possible.
2. If plies can be pulled apart easily, much of the stock can be salvaged.
3. If glue is partially cured, pile panels quickly in a kiln or hot room; or place

1. ***CASCAMITE TS-26*** **. . . for "general purpose" gluing where assembly time between spreading and pressing varies from 0 to 24 hrs. Suitable for light as well as dark woods. (For very dark finishes, add small amount of dye to the glue mix.)**
2. ***CASCAMITE TS-26LA*** **. . . for very long assembly times (4-72 hrs.).**
3. ***CASCAMITE TS-26W*** **. . . same as TS-26, except it provides a very light color, ideal for splicing bleached veneers.**

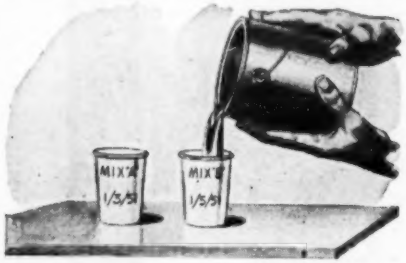
These resin powders can be stored for one year or more in a cool, dry place. They are "one shot" glues, easily mixed by simply adding 55-70 parts of water to 100 parts (by wt.) of CASCAMITE powder.

For full details of mixing, spreading, etc., write for Direction Sheet TD-18a.

## NEW LOW-COST CATALYSTS FOR RESIN GLUES

of wood parts and prime contractors of defense orders. This service is free.

Write for a data sheet, and return it to us with full details of your facilties for various types of wood work. When a prime contractor requests a part which can be made on your equipment, we'll refer your name to him as a possible sub-contractor.




## HOW TO CHECK ON CURE OF COLD-PRESSED PLYWOOD OR FURNITURE PANELS

Retain a sample of each batch of glue that is mixed. About 1 in. in a paper cup is enough. Mark the cup with a batch number and keep it in the glue room, at room temperature.

Regardless of the curing temperature, it is a good idea to always leave a bale under pressure until the corresponding sample of glue has hardened. (At low curing temperatures, the curing period may be up to twice the hardening period of the sample.) In veneer re-dryer or hot press; or pass through a mechanical veneer dryer at high speed, if panels are thin.

## NEW TAPELESS SPLICER GLUES FEATURE IMPROVEMENTS

New CASCAMITE TS-26 glues for tapeless splicing are superior to CASCAMITE TS-16 and TS-24 glues in speed and non-fouling properties, and are expected to replace older types. Three types are available:

New CASCO catalysts for urea resin mixes cost less and can be used in smaller amounts.

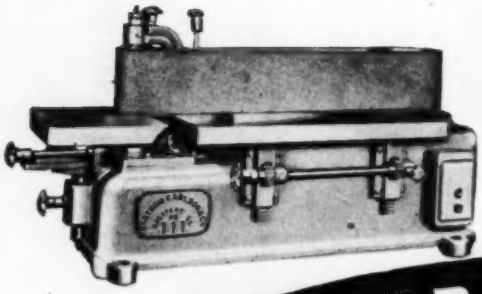
New Catalyst H-71 (compared to its predecessor H-11) has slightly shorter usable life, slightly longer assembly time at higher temperatures, slightly faster curing speed. New Catalyst H-77-L (compared to its predecessor H-27-L and H-51-L) is very light in color, water thin (needs less water or slightly more extender than H-27-L), has slightly shorter usable life, assembly time and curing speed. It contains a small amount of flour modifier, producing smoother, more spreadable mixtures with high flour extension. New Catalyst FM-122 is a "very fast" catalyst, providing about the same results as Catalyst K-6 but easier to handle because of the larger amounts used.

Write for further details on any of these catalysts.

*Address any question on the above data, or any gluing problem, to*

Borden's
CHEMICAL DIVISION
Dept. WD-51 350 Madison Ave.,
New York 17, N.Y.

# EKSTROM CARLSON

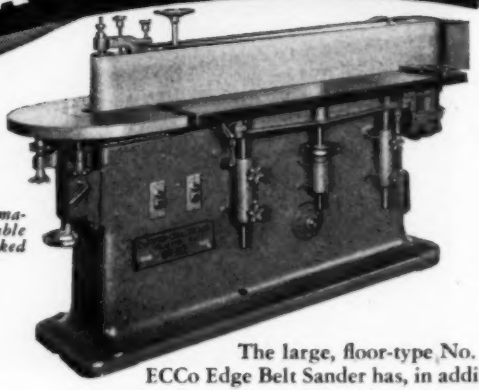


**No. 111**

*No. 111 is furnished as a bench model or on a sturdy floor stand.*

# EDGE BELT SANDERS

***"PROVIDE FOR TOMORROW BY BUYING TODAY"***



**No. 112**

*No. 112 is a single-side machine, No. 112A has double backboards and can be worked at from both sides.*

**WRITE FOR LITERATURE**

Learn all about the interesting details of ECCo Edge Belt Sanders. Write today for copies of Bulletins 111 and 112.

| CONDENSED SPECIFICATIONS | | |
|---|---|---|
| | No. 111 | No. 112 |
| Work Table Size.. | 8"x26" | 11"x60" |
| Abrasive Belt Travel FPM..... | 3200 | 4400 |
| Vertical Adjustment of Table... | 5" | 4" |
| Height of Table in Lowest Position. | 13" | 35" |
| Space Required (With End Table) | 20"x52" | 28"x92" |

The large, floor-type No. 112 ECCo Edge Belt Sander has, in addition to many refinements, an important outstanding feature — the oscillating backboard, the motion of which is synchronized with the oscillation of the belt. This results in a cooler-running belt, longer belt life, and greater sanding power through higher efficiency. The smaller No. 111 machine is a portable unit, available for bench mounting or on its own floor stand, and ruggedly built for *heavy duty* service. The need for a portable machine is amply demonstrated by the large number now in service in prominent woodworking plants of many kinds.

**EKSTROM, CARLSON & CO.**

1411 RAILROAD AVE., ROCKFORD, ILLINOIS

# Twin Threads Mean "Twice as fast"

You can identify TWIN-fast by its twin threads centered point relieved shank parallel sides

Fasten wood to wood, plastic to wood, metal to wood twice as fast—and tighter!

Exclusive double thread of TWIN-fast Screws doubles the thread pitch . . . enters the material twice as far for each turn of the driver—*without extra effort*. Result—

**. . . FASTER DRIVING**

**. . . LESS FATIGUE**

**. . . LOWER COSTS**

Other TWIN-fast features improve fastenings

Write for new TWIN-fast bulletin to any of these firms:

Dennison Screw Company
Dennison, California

Southington Hardware Manufacturing Company
Southington, Conn.

Slocomb Screw Co., Ltd.
Montreal, Canada

American Screw Company
Willimantic, Conn.

Burke & Johnson Company
Waterville 48, Conn.

Can be furnished with either Slotted or Phillips Recessed Head

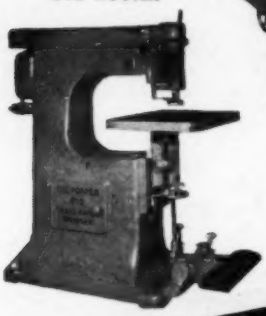
**TWIN-fast**

Reg. U. S. Pat. Off.

Pat. Nos. 2,314,291 · 2,314,339 · 2,373,220 · 2,373,948 and 2,403,185

The Faster Driving . . . Cost Cutting Fastener

206 DOUBLE SPINDLE SHAPER
405 SURFACER
PORTER
machinery
is
DIVIDEND DESIGNED
155 SERPENTINE
SHAPER
105 SINGLE SPINDLE
SHAPER
700 SURFACEMASTER
FACING PLANER



612 ROUTER

300 JOINTER

STRAIGHT LINE AND COMPOUND ANGULAR CUT-OFF SAWS

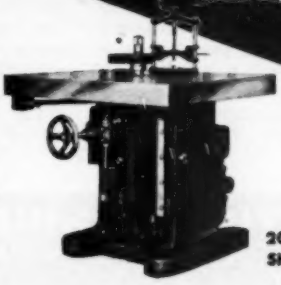
## . . . to give you more production for every dollar you spend

Buying Porter DIVIDEND DESIGNED Machinery is like buying custom-built furniture at a popular price. You get so much more for your money. Your cost per job is less because Porter Machines are faster, take heavier cuts and require less adjusting. They have an extra margin of speed, capacity and strength not found in ordinary machines.

If you need a Router, Saw, Shaper, Planer, Carver, Jointer, Surfacer or Serpentine Shaper it will pay you to investigate Porter, the machinery designed for greater dividends.

**C. O. Porter**
**Machinery Company**
667 Front St. N. W.
Grand Rapids, Mich.

HYDRACUT SAW

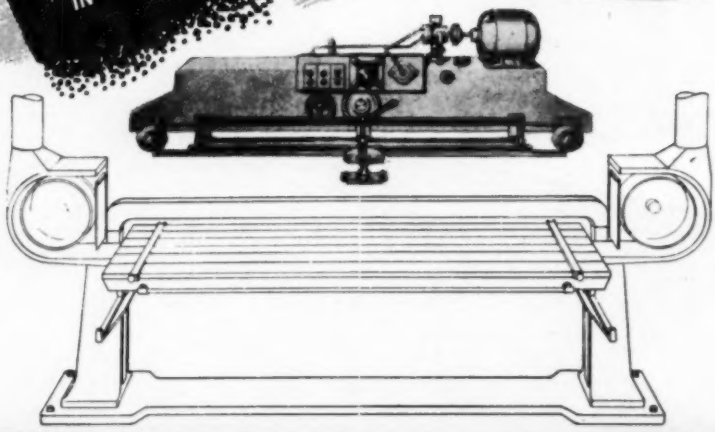


203 SINGLE SPINDLE SHAPER

# CURTIS

FOR GREATER ECONOMY IN PRODUCTION

## 43-RI-C HYDRAULIC AUTOMATIC CONVERSION UNIT AT ½ THE COST



**CONVERTS YOUR PRESENT CROSS BEAM SANDER INTO A MODERN HYDRAULIC AUTOMATIC . . . IN FEW HOURS**

Would you like to step up production as much as 200%? . . . and do so at half the price of a new complete machine without adding to your labor costs? It can be done . . . in fact, it's being done by many plants equipped with the Curtis Hydraulic Automatic Conversion Units! Added to your present equipment, the Curtis will transform your type 8V stroke sander into a modern, high speed, precision, hydraulic automatic machine Your own men can easily make the conversion. The Curtis unit is compact, self contained and complete ready for mounting on the cross beam of your present sander. Length and speed adjustments can be made while the machine is in operation. Investigate the Curtis unit now . . and you'll learn how easily your sanding operations can be done faster, better and more economically Send today for full details . . no obligation at all.

**CURTIS MACHINE DIVISION**

LINCOLN PARK INDUSTRIES, INC.

1300 E. 2nd ST. JAMESTOWN, N.Y.

# Whatever your woodworking job, Armour has just the abrasive you need!

Armour has a complete line of quality abrasives for every woodworking job.

The Armour line includes rolls of paper, cloth (or combination), in either Electrocoated Garalun or Heat Treated Garnet, sheets of cabinet paper, belts, discs and other specialized forms of coated abrasives.

If you are drum sanding, finish sanding, working on panels or any shape or size of stock, there's an Armour abrasive that can help you do a better job for less money.

Your Armour representative will gladly help you select the best abrasive for your operation. Just write or call him today!

**ARMOUR** *Coated Abrasives Division*

**Armour and Company • North Benton Road • Alliance, Ohio**

# STEP UP Productive Capacity

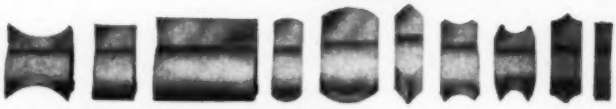
## WITH THE STANLEY S5A TABLE SHAPER

Now is the time to equip your shop to do intricate shaping work . . . fast, accurately, inexpensively. Eliminate the need to rely on expensive trim lumber.

The Stanley Table Shaper, No. S5A, is the all-'round, quality machine for most shop requirements. Outstanding features include: 1 h.p. motor . . . oversize shaft and bearings . . . cast iron table and base . . . 18,000 r.p.m. motor speed. Exclusive spindle tilts 45° backward and 15° forward. Micrometer depth adjustment.

Investigate the benefits of this modern, high-production machine. It will repay you generously in the years ahead. See your dealer or write for descriptive bulletin. Stanley Electric Tools, 433 Myrtle Street, New Britain, Connecticut.

**STANLEY SHAPER CUTTERS.** Stock cutters in a wide variety of shapes and sizes.



STANLEY

Reg. U.S. Pat. Off.

**HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL**

FIGHT WASTE

**NOW!** *In hundreds of plants*

# DISSTON

## FIGHT WASTE PROGRAM

*boosts production . . . cuts costs!*

American industry has really taken to FIGHT WASTE! This new Disston program . . . with its practical tips for the man in the plant . . . has been hailed by industry and government as a pioneering step in conserving vital materials. Tools, materials, and manpower are becoming tighter every day. And, as defense machinery gets rolling, every day sees increased demands for more industrial output.

THE DISSTON "FIGHT WASTE" PROGRAM HELPS INDUSTRY —CAN HELP YOU—GET MORE OUT OF TOOLS, MATERIALS, AND MANPOWER NOW AVAILABLE . . . HELPS INCREASE PRODUCTION, CUT MANUFACTURING COSTS . . . BY STOPPING WASTE!

### HOW "FIGHT WASTE" WORKS:

The basis of "Fight Waste" is the education of workers to use tools properly. To do this, Disston supplies you —*without cost or obligation*—individual instruction cards for your workmen covering 31 different cutting tools (listed below). Each card covers common faults in operation that may result in tool failure; cause of such faults; best method of correction; and general information to improve workmanship, speed production, and prolong useful tool life. Complete information on how to distribute the cards in your plant is also supplied for foremen or supervisors.

## ORDER THESE CARDS IN ANY QUANTITIES:

No. 1 *Power Hack Saw Blades*
No. 2 *Hand Hack Saw Blades*
No. 3 *Milling Saws*—Circular—High Temper
No. 4 *Fast Running Metal Saws*—Circular—Medium and Mild Temper
No. 5 *Carboloy® Saws*
No. 6 *Carboloy® Knives, Cutters, Etc.*
No. 7 *Flexible Back Metal Band Saws*
No. 8 *Inserted Tooth Circular Metal Saws*
No. 9 *General Information on Files*
No. 10 *Saw Files*
No. 11 *Machinists' Files*
No. 12 *Special Purpose and Wood Working Files*
No. 13 *Superfine Swiss Pattern Files*
No. 14 *"Rights and Wrongs"* in Refitting Circular Saws
No. 15 *Wide Band Saws—Log Mill Saws*
No. 16 *Narrow Wood Cutting Band Saws*
No. 17 *Dado Cutters*
No. 18 *Solid Tooth Circular Wood Cutting Saws*—Flat Ground—Rip and Cross-Cut
No. 19 *Circular Wood Cutting Combination Saws*—Hollow Ground—Raker Tooth Type
No. 20 *Circular Wood Cutting Combination Saw*—Flat Ground—Raker Tooth Type
No. 21 *Solid Tooth Circular Edger Saws*
No. 22 *Solid Tooth Circular Trimmer Saws*—Flat Ground
No. 23 *Narrow Band Saws for Cutting Plastics*
No. 24 *Solid Tooth Circular Plastic Saws*—Hollow Ground
No. 25 *Circular Knives*
No. 26 *Paper Knives*
No. 27 *Thin Planer Knives*
No. 28 *Heavy Planer Knives*
No. 29 *Veneer Knives*—Rotary and Slicer
No. 30 *Chipper Knives*
No. 31 *Cutter Heads*—Circular, Generated and Straight Knife Types

(In addition to these Tool Cards, there are also six special cards on Tool Steels—supplied on request.)

**ALSO FREE ON REQUEST:** Any necessary quantities of "The Pocket Foreman"—a valuable booklet reprinting all cards, with helpful information telling foremen how to apply "Fight Waste" in their departments; how to use the plan for maximum benefits in increasing efficiency. And, for your plant in general, Disston supplies stickers, wall and bulletin board posters to make everyone conscious of the vital need to FIGHT WASTE!

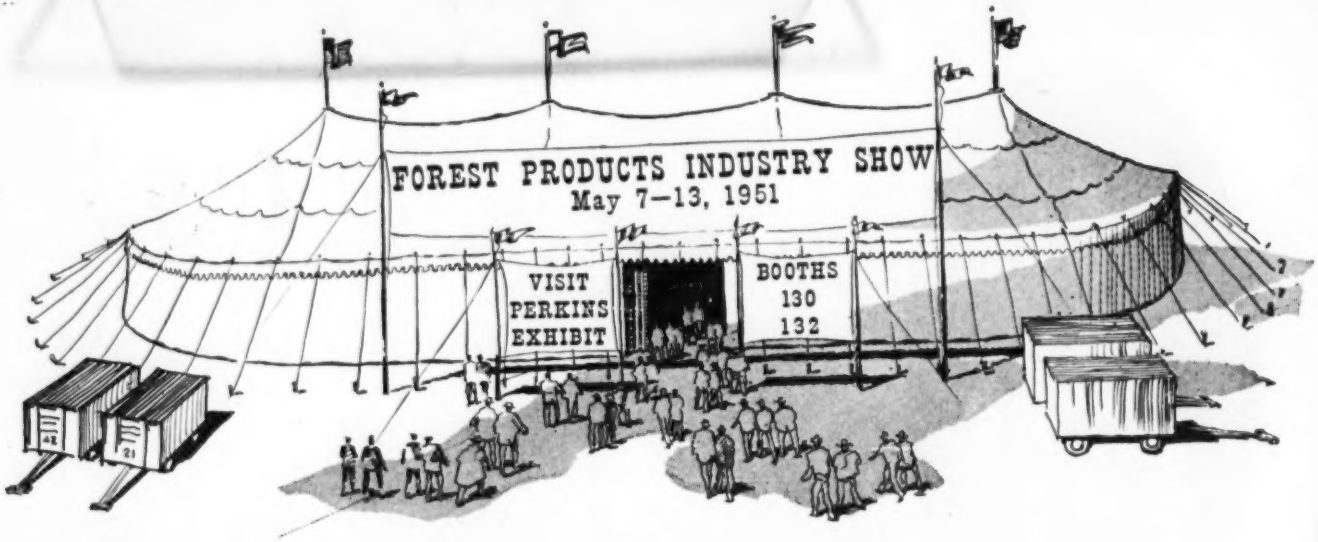
**ASK YOUR DISSTON DISTRIBUTOR**

for information on applying this plan in your plant; for help in determining your needs for "Fight Waste" material. Or, write us direct.

*® Carboloy Co., Inc.

**HENRY DISSTON & SONS, INC.**

595 Tacony, Philadelphia 35, Pa., U. S. A.
Pacific Coast Factory: Seattle, Washington
Canadian Factory: Toronto 3, Ont.



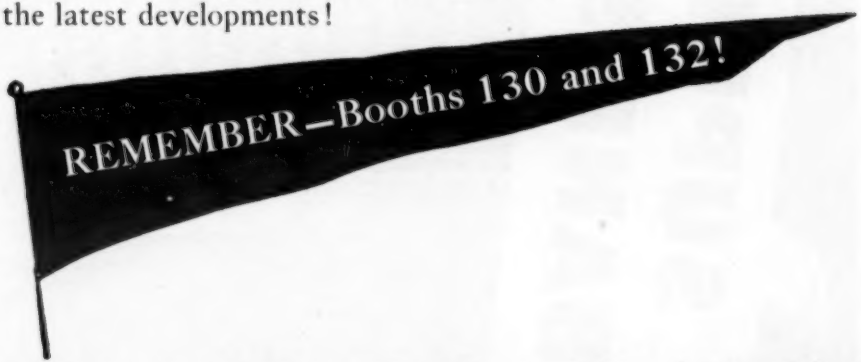

# THERE'LL BE A BIG TIME IN OLD PHILADELPHIA!

When the woodworking industry gets together for the Forest Products Research Society Convention at Philadelphia's Convention Hall in May the old town will contain the biggest collection of leading furniture and plywood men ever to assemble in one location.

And right there to greet them, of course, will be a familiar old

Finding us, as usual, will be quite easy. When you enter the famed International Industry Show just glance half-right and there we'll be in Booths 130 and 132 facing the entrance. Be sure to make our booths your first stop and let us bid you a friendly welcome.

As always, we'll have the latest (and, we honestly believe, best) in wood glues to show you. If you have any question about glues or gluing, our booth is the place to seek an answer. But, even if you don't have any gluing problems at the moment, be sure to check on the latest developments!




# PERKINS GLUE COMPANY

*Manufacturers of Resin, Casein, Vegetable, and Liquid Hide Glues*

LANSDALE, PENNSYLVANIA · HIGH POINT, N C. · KITCHENER, ONTARIO

# SUPREME BAND SAWS

● SUPREME BAND SAWS cut faster... have increased cutting capacity with minimum breakage! Present day high speed equipment demands SUPREME SAWS. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness... to stay sharp! There is a Supreme Band Saw for every industry... for every material. Special purpose saws are made to order.

## BEST FOR EVERY INDUSTRY

**The SAW & KNIFE SPECIALTY CO., Inc.**

6526 CARNEGIE AVENUE • CLEVELAND 3, OHIO

# Are you harboring a saboteur ?

It is imperative that as soon as you can, you check the production total of the men working on your various machines. You may be surprised to find you have saboteurs in your shop that are causing serious bottlenecks.

You will no doubt find that it is not the fault of the workmen, but the machines they are working on that are causing the trouble. Yes, obsolete equipment may be costing far more than you realize. For it prevents your men from obtaining maximum production efficiency.

Scrutinize not only your present equipment, but your methods as well, for the time may have come for you to change both. By replacing and modernizing both methods and machinery, you can gain double benefits. You will have more efficient production and greater profits. Protection from inefficient methods and obsolete machinery needs the same thought and care used in protecting your plant from within and without against more readily recognizable saboteurs.

Manufacturers, serving all phases of the woodworking industry, stand ready to help you make a check in your own plant. Their experience and equipment can help you to your rightful place in our country's defense mobilization program.

May 7 to 11, Convention Hall, Philadelphia, the Forest Products Research Society will hold an International Industry Show and Convention. Elsewhere in this issue we have outlined the program and purposes of this meeting. Here, too, you will have an opportunity to check your methods and machines against what is currently offered to and used by our industry.

Neither the government nor the state will investigate the type of sabotage discussed in this editorial. The responsibility is yours, but the benefits are also yours!

*Ned Bailey*

*Editor-in-Chief*

# From golf clubs

For finishing tricky combinations of wood and metal, a golf club manufacturer has found that nothing equals heat-resistant Jewelox Cloth Belts. Like all Jewel Brand Abrasive Belts, they have the exclusive, smooth-running Velvet Joint.

# to cabin cruisers

Plywood, now used more than ever by the boat-building industry, can be finished faster, at amazing savings, by Jewel Brand Bondex Garnet Fibre. This production-boosting abrasive for drum sanders lasts up to 8 times longer than ordinary garnet.

**THERE'S A JEWEL BRAND COATED ABRASIVE** to do every job, large or small, and to do that job *quicker, cleaner,* at *lower cost!* Ask your distributor or write on business letterhead for catalog. Abrasive Products, Inc., 551 Pearl Street, South Braintree 85, Mass.

**SHARPER, TOUGHER**

**Jewel COATED Abrasives**

**CUT COSTS!**

# Pointed Paragraphs

Salesmen can sell the men they see — it's a cinch they can't sell the ones they don't see — so it's reasonable to believe that the more men they see, the more they will sell. The limiting factor is time. Anything that increases the salesmen's selling time increases his capacity for turning in business. Appropriate use of the printed word in any or all of its various forms such as direct mail or publication advertising are means that you can use to aid the salesman. The printed word makes it possible for you to mechanize many parts of the sales producing job, just as machine tools mechanize many motions in sales procedures.

*Freight cars on order have hit a historic high. The backlog has swelled to more than* 144,000. *Current deliveries are running* 6,000 *per month and may reach* 10,000. *Army purchasing agents, as well as railroad men, are showing a marked interest in the new model plywood freight car, Unicel. They like the considerable saving of steel each wooden "Unicel" represents, as compared with a conventional freight car.*

Regardless of what is happening in military circles, business and industry are going ahead with production and expansion plans disregarding the possibility of peace moves and the prospect of stiff materials controls. Automobiles are rolling off production lines at increasing rates and the New York Stock Exchange has been showing "bullish" tendencies. Sounds like business is feeling better. However, there are a few strikes on deck that might possibly scramble up things a bit.

*Clark E. McDonald, Secretary-Treasurer of the Southern Sash and Door Jobbers Association, made a very good suggestion the other day. He believes that we should exchange problems because everyone*

(Continued on page 40)

# A SYMBOL OF PERFECTION

Since the introduction of the first thin knives, Yates-American has always maintained exceptionally high quality standards.

Now, after considerable research and use of the most modern methods of manufacture, Yates-American is proud to present a new and improved High Speed Steel Knife which is unexcelled.

Place your order now for immediate delivery. Standard sizes in stock at High Point, North Carolina, Memphis, Tennessee, and Portland, Oregon.

## THIN KNIVES

Yates-American Thin Knives are made from carefully selected materials, to suit your individual requirements. Nine operations are required in their manufacture:

1 **Cutting**—Selected

**2 Pre-Processing**—An important step in creating a stronger knife.

**3 Heat Treating**—Performed in the latest type atmosphere controlled furnaces.

**4 Surface Grinding** — Done on specially designed knife grinders.

**5 Edge Grinding and Beveling** — Accurate to width.

**6 Inspection and Testing** — Individually inspected and tested for hardness.

**7 Cut-Off and Balance**—Precisely done to the highest standards of accuracy.

**8 Plastic Packaging** — Knives are completely covered with an airtight, waterproof coating. Protects against rust, corrosion or damage to cutting edge. No cut fingers.

**9 Marking** — Each knife is electrically etched with its dimensions.

# Yates-American

MACHINE COMPANY—Beloit, Wisconsin

BRANCH OFFICES: Chicago, Illinois
High Point, North Carolina
Memphis, Tennessee
Portland, Oregon

MATCHERS • BAND RESAWS • SANDERS • SURFACERS • CIRCULAR RIPSAWS

(Continued from page 37)

*knows how to solve the other fellow's. The Association will hold its Annual Membership Meeting, Monday and Tuesday, June 4 and 5, Peabody Hotel, Memphis, Tenn. These meetings are always very worthwhile. Make it a must this year if you possibly can.*

Due to the active demand for practically all grades and sizes of all hardwoods the market shows sustained strength. Most operators have been holding their prices at about December first levels and are not seriously affected by application of the price freeze, except for the difficulty of applying it in detail.

*Labor and management should receive credit for the voluntary manner employed after the start of the Korean hostilities, to develop and maintain their hiah production schedules. Federal Reserve Board figures attest to the fine record, showing that industrial production climbed to a new postwar high in March. The total production of all goods and services in the first quarter jumped to an annual rate of* $316 *billion, a* $16 *billion gain over the final quarter of* 1950.

Veneer and plywood production is getting tuned up for gradually developing military and industrial demands. It is expected that their use in consumer products will be given greater consideration than they were in World War II by both the government and the veneer and plywood manufacturers.

*Furniture output and orders are holding close to peak levels. As of March* 1, *new business has risen* 22% *over the comparable* 1950 *dollar volume. Shipments were up* 27% *and unfilled orders had mounted* 62% *beyond the year ago total. Final tabulations of February home furnishings sales showed an average national increase of* 10% *over the same month a year ago.*

Our Safety Editor has suggested that we ask you readers to let us know about the safety records and accomplishments you are attaining in your own plants. Our thought is to give you further public recognition in our Safety Section.

*Getting this issue of WOOD WORKING DIGEST off to the printer in time to pass it along to you during the Forest Products Research Society Convention has been a little difficult for our staff. However, our entire office and print shop force has worked together, making it possible for you to receive your convention issue on time. We're looking forward to meeting many of you in booth No.* 122; *be sure to drop in and say "hello."*

## *The* **TOUGH** *bonding jobs call for*

# PENACOLITE® RESORCINOL ADHESIVES

***. . . they're WATERPROOF***

Because of the high moisture conditions and rugged service to which these Navy PT Boats are subjected, the bonding agent has to be strong. That's why Penacolite Adhesives were used. Penacolite Adhesives are unaffected by salt or fresh water . . . by molds, fungi, oils, cleaning solvents, most acids. And they're highly resistant to shrinking and swelling stresses.

***. . . they're WEATHERPROOF***

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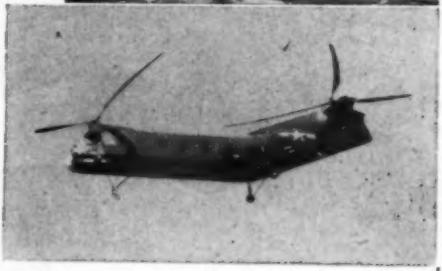

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# INSULATION AND HARDBOARD MANUFACTURE

BY R. T. DE PAN

DEVELOPMENT ENGINEER, DOWNINGTOWN MFG. CO., DOWNINGTON, PA.

CONSIDERABLE interest has been shown in this country in recent years in processes and equipment for the manufacture of insulation board and its somewhat denser counterpart hardboard. The interest has been stimulated to a great extent by the increased demand for low cost building materials, by the increased difficulty in obtaining first-grade peeling logs for plywood manufacture, by the increasing awareness of lumber mills and wood using industries of the need or desirability for utilizing waste and trim, and by the definite trend toward conservation and the necessity for more efficient utilization of one of our natural resources, the forests.

**Insulating Board**

The term insulating board as considered here indicates a porous rigid board composed of wood or vegetable fiber material. Although its insulating value decreases with increase in density, strength requirements place the lower limits of its density in the range of 14 to 20 pounds per cubic foot. Commercial thicknesses are usually ½ inch for wall panels, planks and tiling, up to 25/32 inch for sheathing purposes. Some ⅜-inch board is being made and laminated products up to 4 inches thick for roof insulation are also produced.

Due to the multiplicity of raw materials used there are numerous processes for the manufacture of insulating board, but only those utilizing wood in some form or another will be discussed. Also, processes producing less than 50,000 sq. ft. per day will not be considered.

**Stock Preparation Methods**

There are usually two broad methods for producing fiber for insulation board purposes, namely by grinding or by use of attrition mills of some sort.

**Grinding**

Perhaps the greatest percentage of fiber produced for insulating board is made by grinding the wood. Grinders may be of the pocket or magazine type. Wood bolts about 30 inches long and 4 inches to 20 inches in diameter are placed parallel to the face of the grinding stone with the long direction of the wood parallel to the shaft of the grinder. The stone of a specially designed abrasive travels at high speed. The wood is pressed to the face of the stone by a ram until it is ground into small fibers or fiber bundles. Water is played on the surface of the grindstone to prevent the wood from burning and to wash away fibers already ground. Wood for grinding is usually in the green state and is sometimes soaked in water or weak chemical solution before being ground. Grinding has a high production for unit cost of equipment

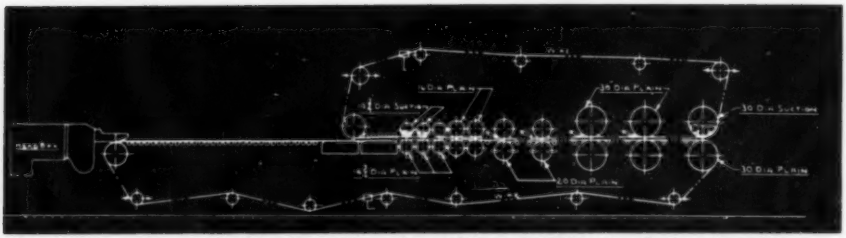

**Fig. 1. Elevation of 170-inch wallboard machine used for insulation board manufacture.**

but is limited to the physical size of the stick it uses. At present, work is being done on the grinding of chips and if it proves practical will enable insulation board manufacturers to use waste and small sticks in their process.

### Attrition Mills

A continuous type of fiberizing machine used both in this country and aboard is the Asplund defibrator. Wood chips are pulped in the defibrator at elevated temperatures in a steam atmosphere corresponding to pressures between 125 and 175 psi. The wood chips are continuously introduced into a high-temperature preheating chamber by means of a screw or plunger feed. Heating by saturated steam at temperatures ranging from 350° to 370° F. causes softening of the binding substances between the individual fibers. After passing through the preheating chamber, the heated chips are conveyed to the attrition disc while still under pressure. Here separation of the fibers is effected by passing the chips between a rotating and stationary disc. After defiberization the pulp is blown from the defibrating chamber through reciprocating or nozzle valves to a collector under atmospheric pressure. A defibrator may be expected to process 10 to 30 tons of dry wood per 24 hours depending on the type of wood and the degree of fiber separation desired. Asplund fiber may be further refined, after defiberization. For use in insulation board in this country, Asplund fiber is usually mixed with groundwood or fiber produced by other types of attrition mills. It may be refined and used to the extent of 100 percent in board if so desired.

Other types of equipment for producing insulation board fiber from wood include the Bauer pulper, the Allis-Chalmers Interplane grinder, the Sprout-Waldron refiner, the McMillan machine, the Elmendorf defiberizer, the Weinerfiner and hammermills. The Bauer pulper has the greatest usage

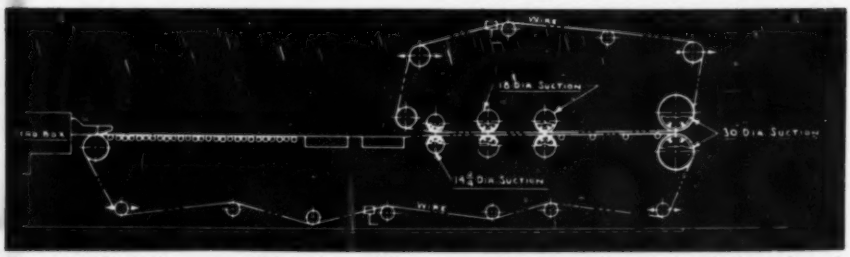

**Fig. 2. Elevation of 120-inch wallboard machine used for insulation board manufacture.**

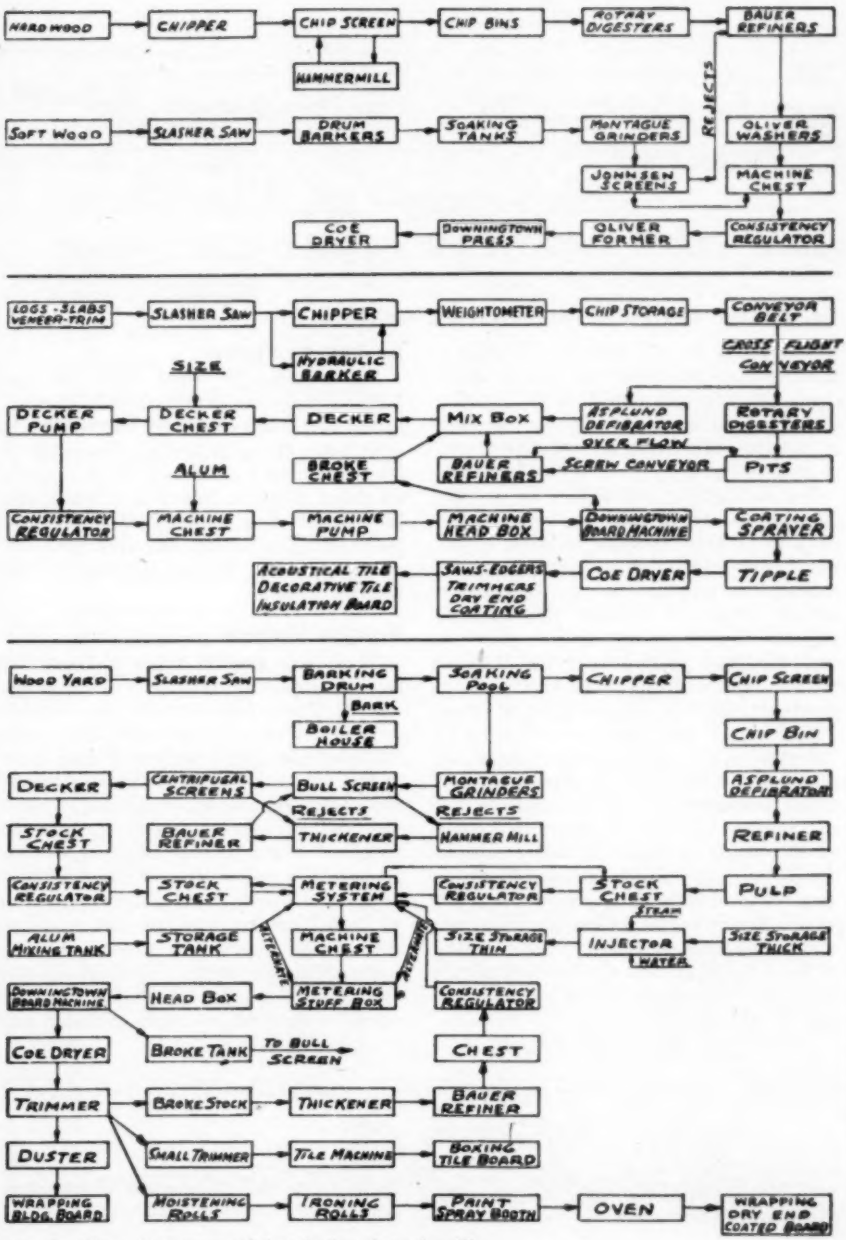


**Fig. 3. Flow diagrams of insulation board mills.**

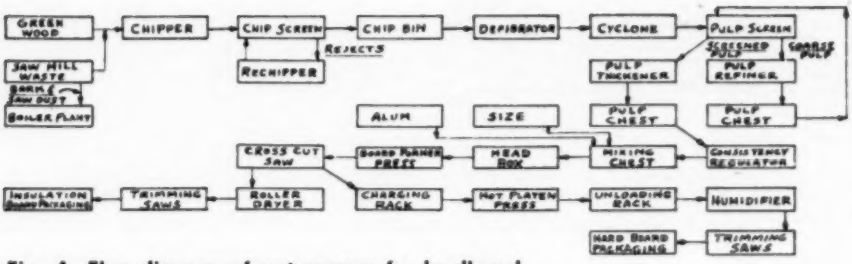


**Fig. 4. Flow diagram of wet process for hardboard.**

in the mills in this country. This is a double-disc machine in which both discs are rotated. Stock is fed to the center of the discs through an opening in the center of one and is discharged at the periphery.

For defibering wood for use in insulation board it may be advisable to cook it in some manner. A mild treatment may consist of a steaming at atmospheric pressure or a soaking in boiling water. A harsher treatment is effected by steaming under pressure and the time of steaming will depend on the type of fiber used and the end product desired. The treatment may vary from a few minutes steaming at 300 psi. to 120 minutes steaming at 30 psi. Very usable fiber is prepared from chips steamed for 15 minutes at 100 psi. Spruce, balsam, fir, aspen and some of the pines in green or water soaked condition are being converted with disc refiners without any pre-treatment at all. Power consumption on the above varies from 30 to 12 hp. days per ton. A Bauer pulper will therefore produce 10 to 25 tons per 24 hours with an input of 300 hp.

### Cooking Equipment

For cooking the wood, rotary or stationary digesters may be used. The rotaries are most common and range in size from 12 to 18 feet in diameter. A 16-foot globe rotary will hold 8 cords of chips. Birch, a heavy hardwood, can be cooked to a yield of 85 percent at the rate of 10 cycles per day or a capacity for the 16-foot digester of 125 tons.

### Forming Methods

There are several types of machines for continuously forming insulation board. They are namely the double cylinder type of machines, the single cylinder type, and the fourdrinier type.

The two-cylinder machine was one of the earliest successful machines in commercial operation. A large wire-covered cylinder 6 or 8 feet in diameter is supported in a vat with a similar cylinder supported above it at an angle of about 45° also dipping into the vat, material from which is carried upward to form a considerable hydraulic head on the two cylinders. Half of the finished sheet is formed on each cylinder and

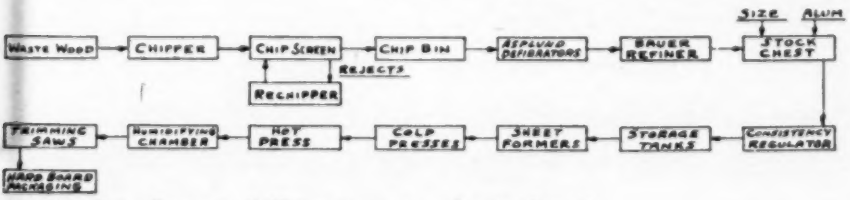


**Fig. 5. Flow diagram of Chapman process for hardboard.**

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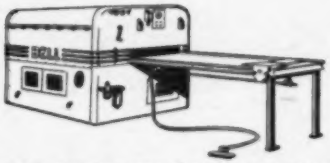

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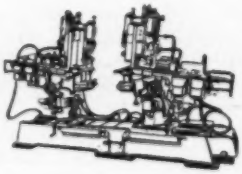

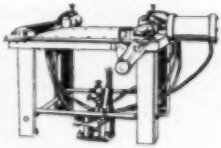

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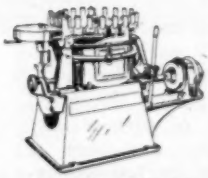

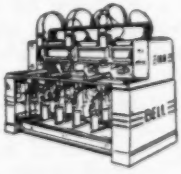

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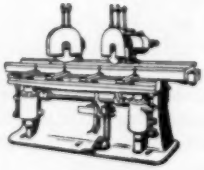

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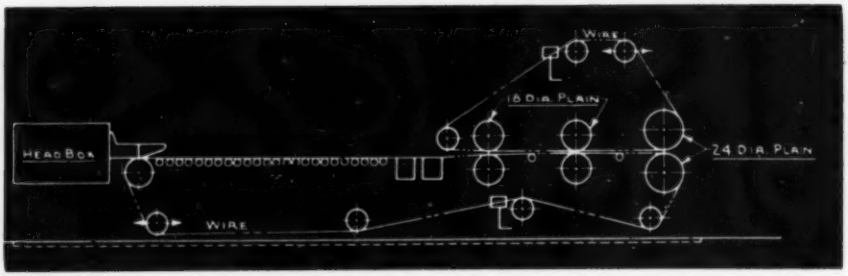


**Fig. 6. Elevation of 64-inch hardboard machine.**

the two parts are pressed into one board on leaving the nip of the cylinders. The board then goes to a press section before drying.

The single-suction cylinder picks up the sheet by vacuum created by a barometric leg and a vacuum pump. Consolidation of the sheet is assisted by means of press rolls mounted on top of the cylinder mold. The board then goes to a press section before being dried.

The fourdrinier forming machine is somewhat similar to the conventional fourdrinier except that the forming and press sections are combined. One wire passes over the board forming section through the presses so that the board is undisturbed before going to the dryer. A top wire or felt is used on the press section.

The press section for continuous forming machines will vary considerably depending on the draining characteristics of the sheet and the speed desired. The number of presses may vary from two to ten and may be either plain or suction on top or bottom or both. Suction slices may be placed in back of the presses to remove the pond of water accumulated there. Spring or pneumatic loading may be used. Press sections may be non-cantilevered or fixed or adjustable cantilevered. Presses are equipped with stops to regulate clearances between the rolls. Fig. 1 and Fig. 2 illustrate possible variations in press sections.

**Drying Methods**

Owing to the thickness of the board it must be dried in a flat condition and four different methods are used. These are (a) multiple-deck hot platen driers, stationary, (b) multiple-deck hot platen driers, moving, (c) tunnel driers, and (d) multiple-deck continuous roller drier. The last type of drier is most widely used in this country.

**Flow Diagrams of Wallboard Systems**

Fig. 3 illustrates three typical setups for the manufacture of insulation board in this country. For production of good quality board at a fair rate of speed it is essential that the fiber mixture consist of a mixture of long fibers for structure and ease in drainage and short fibers for the strengthening characteristics. There is, of course, a medium wherein the greatest percentage of fibers can be approximately of the same length. Development of the fiber must be to such a degree that the board possesses the necessary strength characteristics commensurate with the desired draining qualities and bulk factors. Appearance of the board itself is also quite important. In the examples shown, one method frees up the normal groundwood furnish with some long fibered Asplund fiber. In another method this freeing up of the groundwood pulp is accomplished by using Bauer-refined stock. The third method

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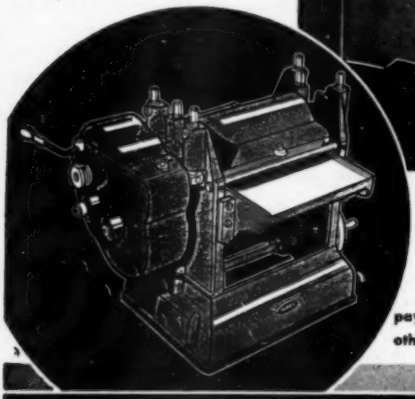

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**Hardboard Manufacture**

Within the past few years there has been considerable interest shown in the manufacture of hardboard in this country and abroad. Part of this is due to the recent expiration of certain basic patents.

There are numerous processes for the production of hardboard as such. Some of these utilize some form of binder and as a base material sawdust, shavings or fiber produced by other than attrition mills. These are so called "dry processes" in that the material to be molded is spread into the molding trays as a dry mix and not suspended in a water medium. There are numerous variations of this "dry process", which will not be discussed at this time.

Hardboard as it is popularly known on the market is commercially produced by two methods. These two methods are similar in most of the steps of manufacture.

**Wet Process Hardboard**

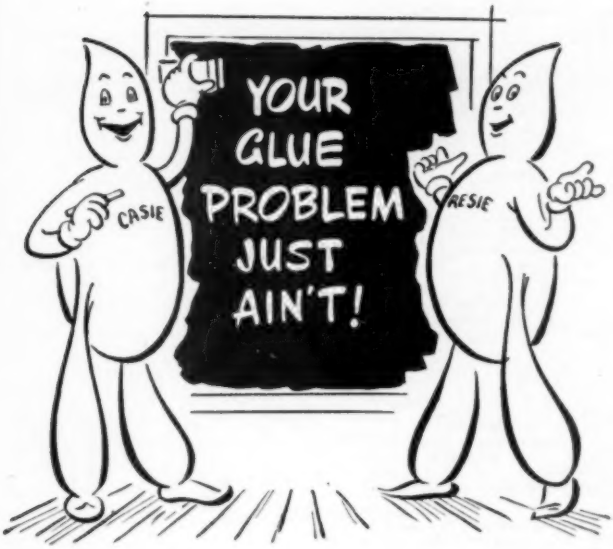
In this method of manufacturing hardboard (see Fig. 4) the fibrous mat formed by draining a fiber suspension in water is pressed in a heated platen press while still containing about 50 percent water. Pressures used vary from 425 to 850 psi. depending on the type of wood used. It is customary to use a high pressure for the first part of the pressing cycle and then decrease it during the latter part. Temperatures used approximate 350° to 400° F. Time for a complete cycle will vary slightly but will approach 15 to 20 minutes.

The wet process for making hardboard was originated by Mr. Mason approximately 25 years ago. The Masonite Company utilizes a process for producing fiber that involves high pressure steam treatment followed by a quick release of pressure. Both hardwoods and softwoods are used and, though usually barked, may be used with the bark. The five-foot bolts of wood are chipped into pieces approximately ¾ inch square and, after being screened, are fed into a battery of 20-inch-caliber guns. A gun is filled and closed and steam admitted until the pressure registers 1,000 psi., equivalent to 550° F. or 285° C. After being held at this point for a few seconds the bottom valve of the gun is opened and the chips exploded against a target into a brown fluffy mass of fiber. Entering a cyclone the steam is let off and condensed and the exploded fiber falls into a stock chest where it is mixed with water and pumped through washers, refiners and screens. Forming is accomplished on a fourdrinier-type machine after which the board passes between roll presses and then into a platen press for final pressing. The end product is very sensitive to the steaming time, which is dependent on the type of wood and the size and moisture content of the chips.

Other common methods for making fiber for hardboard are by use of the Asplund defibrator followed by a refiner or by use of the Bauer refiner preceded by a cook of some sort. Tonnages and degree of fiber reduction can be varied by varying disc setting and cooking time.

Methods for forming the hardboard mat are continuous-forming by means of the fourdrinier former or the suction cylinder, and batch forming in large sheet molds. This latter method of forming is usually adapted to lower tonnages than is the continuous system. The wet batch process for hardboard as used on the West Coast is known as the Chapman Process and the major steps are shown in Fig. 5.

Pressing of the wet mat in the continuous system is accomplished by means of a series of roll presses, some

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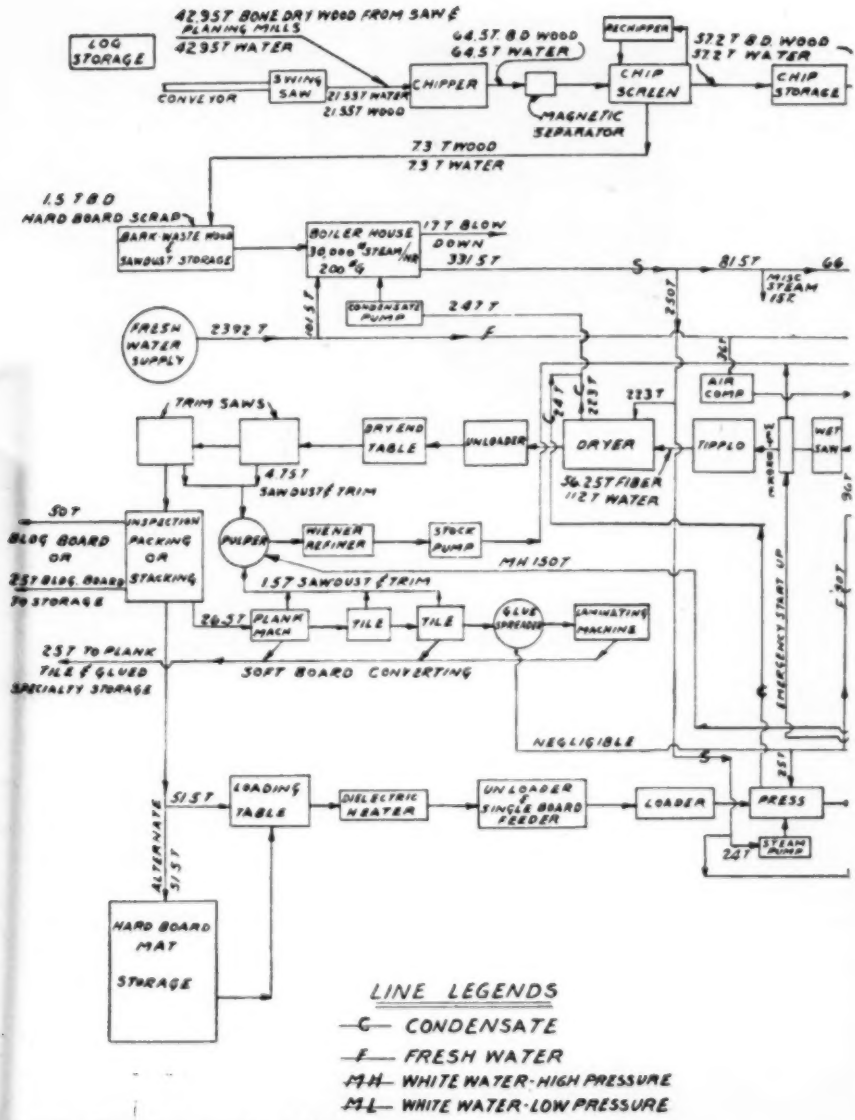
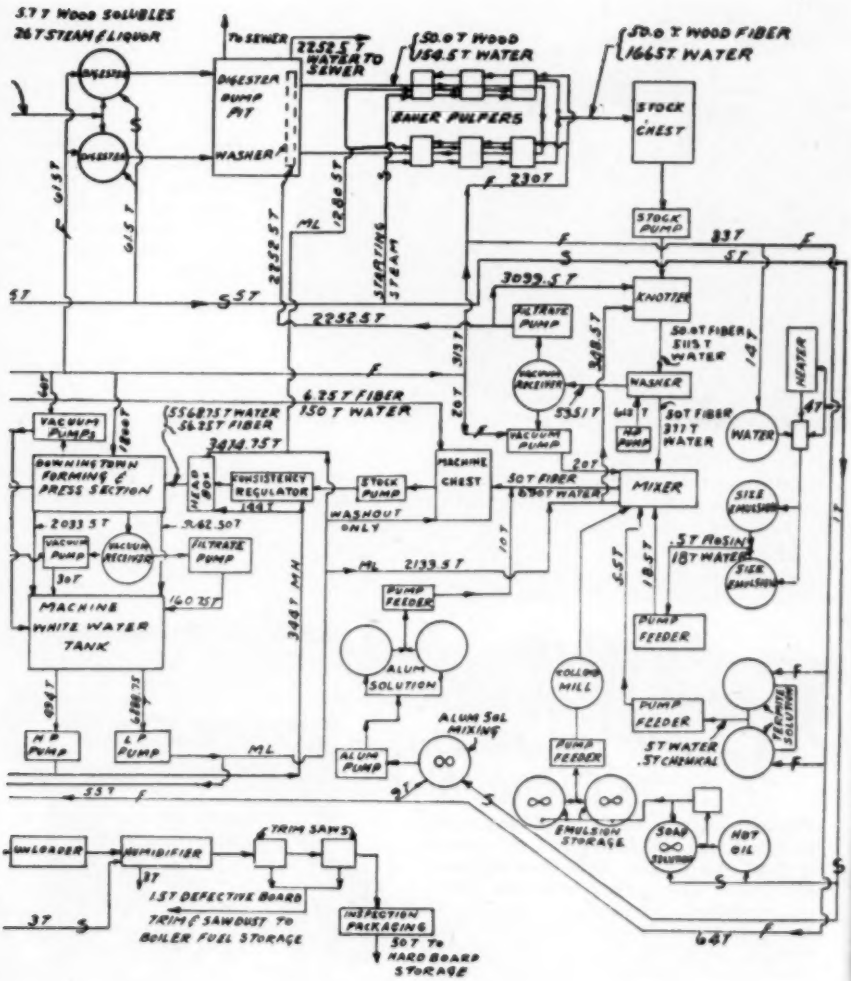



**Fig. 7. Flow diagram of combination hardboard-softboard plant.**

of which may be suction rolls. Pressing of the mat formed by the batch method is usually done with a platen press. Pressing of the wet hardboard sheet




does not present much difficulty as the fibrous mat is quite free and loses water readily. Fig. 6 shows a typical machine for forming and pressing hardboard.

After pressing, wet process hardboard made by the continuous system is cut into suitable lengths and is moved into a press loader. This is a multi-deck rack with the number of openings corresponding to the number of openings in the platen press. In the wet process this is usually a 20-opening affair.

By one method of loading the cut boards move automatically into the various decks of a stationary rack by means of a tipple arrangement. When this rack is loaded the boards are

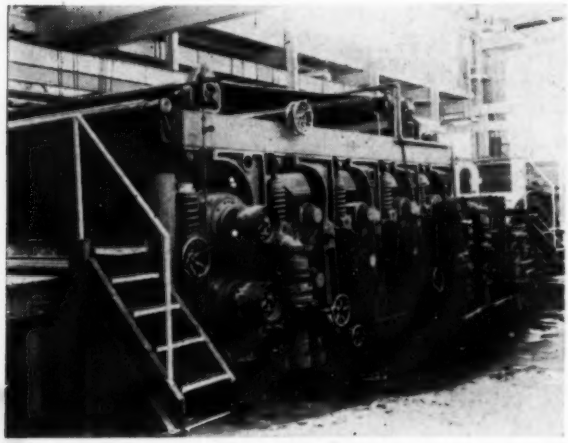


**Fig. 8. Typical Downingtown press section showing combination of plain and suction press rolls. Suction rolls are used both top and bottom.**

moved simultaneously into a movable intermediate rack which has been connected to the stationary rack. This movable rack after being filled is moved to the press and the boards transferred in one operation into the press.

By another method of loading the rack being loaded from the machine is elevated a deck at a time until it is filled. The boards are then moved simultaneously into the open press.

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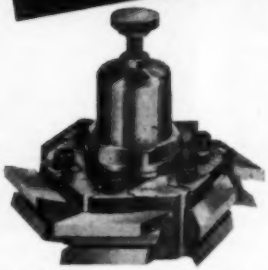

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A 5907-1P-A

wet, wet process board requires a screen on one side of it so that in drying the steam generated may escape. This leaves a permanent wire mark on one side of the board. Stock prepared for wet process board is free enough to permit this escape of steam during pressing. Thus it is unnecessary to refine the fibers to the degree required for insulating board.

**Dry Process Hardboard**

Stock for hardboard by the dry process may be prepared somewhat similarly to that prepared for wet process board. The fibrous mat is formed and pressed in the same manner as by the wet process. However, unlike the wet process the board for the dry process is passed through a long drier and dried to bone dryness or nearly so before it is placed in the platen press for consolidation into hardboard. The product before pressing is similar in appearance to insulation board. Pressures for dry process board are usually higher than for wet process board (1,000 to 1,500 psi.) as are the temperatures, 300° to 450° F. The pressing cycle is considerably less as it is possible to consolidate the board in as small a time interval as 1½ minutes. Usual pressing cycles are 2½ to 3 minutes.

Dry process hardboard is smooth on both sides as both of the press platens or caul plates used are smooth. Fiber prepared for dry process board is usually refined to a higher degree than for wet process board to allow for easier handling of the unconsolidated board. The quality of the pressed board depends on the quality of the unpressed board.

The amount of unreclaimable trim from board made by the dry process is about 3 percent less than for the wet process.

While dry process board requires a drier for making the board, because


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1. Complete safety from kick-backs; 2. Reduced possibility of direct injuries; 3. Cuts chips, not sawdust; 4. 30% to 40% power saving; 5. Longer life without sharpening; 6. Smooth cutting; 7. Quieter running; 8. Less danger of blade cracking; 9. Made of chrome Vanadium Steel; 10. Available with solid tooth or carbide tipped.

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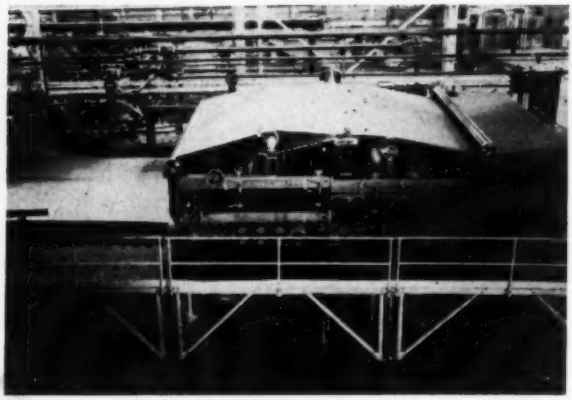

**Fig. 9. Downingtown wallboard forming machine and press section.**

of the shorter pressing cycle a press with fewer openings is required than is used for the wet process. Loading and unloading equipment also is usually not as complicated or costly.

**Humidifier**

In addition to equipment previously described it is essential in hardboard manufacture to provide a chamber wherein the board which is bone dry after pressing may be humidified to a moisture content of 5 to 6 percent before being packaged. Unless this is done the dry board tends to warp unevenly as it picks up moisture from the air.

There is no standard method for


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I've been a builder for over thirty years and in that time I've bought a lot of plywood. Maybe I might have saved a couple of pennies by shopping around but I found it pays to buy from one source.

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### *saves time and expense*

Texlite requires no hand-picking or shaping.

Texlite, with exclusive built-in insulator*, eliminates cost and labor of separate insulator.

Texlite is available pre-cut, ready to install.

Texlite takes a tack for easier upholstering.

### *makes better upholstered pieces*

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Texlite, precision-cut, faithfully executes style lines—every piece alike.

Texlite reduces filler weight by as much as 50%.

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humidifying the board. One method consists of unloading the boards from the press into buggies where they are placed on end with spacers between. Each buggy should contain a multiple of the number of openings in the press. The humidifier consists of a tunnel with tracks to guide the buggies full of board. To prevent the humidifier from being excessively long the tunnel may be wide enough to accommodate, for example, two or three pairs of tracks in parallel. It is convenient to have some sort of puller mechanism so that the full line of buggies can be moved forward one buggy at a time as they are periodically loaded from one end and unloaded from the other.

One company has an open tunnel with rollers along the bottom and wire spacers running lengthwise of the tunnel about 30 inches above the rollers. Boards are loaded on edge on the rollers two boards to a space. The rollers carry the board along slowly and they are unloaded by hand at the far end. Both ends of the humidifier are open and air is circulated upwards and downwards between the boards. The air is humidified in equipment either on top of the humidifier or beneath the floor.

Obviously a continuous roller deck humidifier would be ideal. However, with humidification running from 4 to 6 hours this would be a rather lengthy and expensive piece of equipment. For a very large production though a humidifier of this type might be feasible. Boards could be fed directly from the press into the humidifier with only a transfer in between.

In the normal humidifier the relative humidity is on the order of 80 to 85 percent. The higher the temperature the more rapid is the rate of humidification. However, temperatures too high present operating problems not


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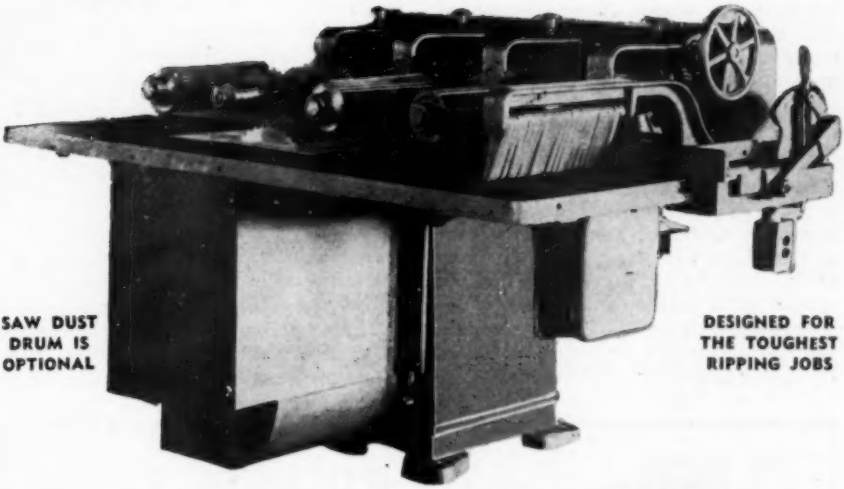
## NO. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW



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DESIGNED FOR THE TOUGHEST RIPPING JOBS

**FOR QUICK OPERATION - DEPENDABLE PERFORMANCE**

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H. P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs.

Available for direct motor or V belt drive.

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encountered in the lower range. It has been found practical to humidify at temperatures of 100° to 120° F.

**Heat Treating**

Heat treating of hardboard has been found practical to increase strength. The method heat treating may be similar to that for humidifying except that moisture is absent. Temperatures of 120° to 140° C. for 4 hours has been found to increase the strength of wet process board about 25 to 30 perecnt.

**Tempering**

For some uses it has been found advisable to "temper" the hardboard. This tempering is accomplished by adding a resin or oils such as linseed, tung, soy bean or tallol. This additive may be combined with the pulp in the form of an emulsion or the boards may be dipped into tanks containing it. The impregnated board is heat treated in hot air chambers and care must be exercised due to the fire hazard.

**Combination Plant**

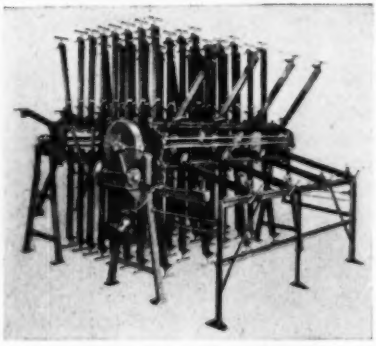
It may be advisable in some locations due to the available market to consider a plant in which it is possible to make both softboard and hardboard. Thus when the demand is low for hardboard the plant can be used for making softboard or vice versa. One such combination plant is shown in Fig. 7.

As in the manufacture of soft or insulation board it is necessary to use a drier, such a plant is equipped to manufacture hardboard by the dry process. Investment in a combination plant is, of course, not too much higher than for a plant equipped to make either the hard or soft product.

**Plant and Process Considerations**

In planning any type of mill for the manufacture of board there are a number of important considerations.

The available and future market is, of course, the prime consideration in planning for a mill. It is of no avail to

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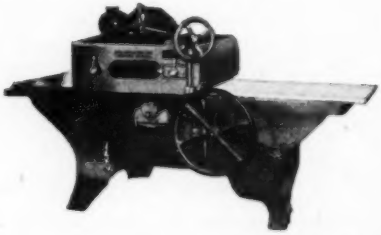

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FOR EXPORT — BEHR-MANNING OVERSEAS INC., NEW ROCHELLE, N. Y.

make a good product unless it can be sold. The number of uses for both soft and hardboard is being materially increased and we may expect them to continue to increase as the methods for treating and converting improve. A better product and lower cost of manufacture will also permit these products to compete with existing products used for similar purposes.

**Type and Continuity of Raw Material**

The available raw materials is a major consideration in selecting stock preparation equipment for making board. Also, it must be certain that the mill once established will not soon lack for easily available raw material within the price range which will enable it to make and sell board competitively. The amount of this raw material will also be of major importance in deciding the size of mill to be built.

**Cost Consideration**

Available capital, of course, will determine to large extent the size and type of board plant to be built. Some types of plants will require a heavier investment than others. This initial outlay, however, should be balanced against the overall cost of making board after the plant is built.

Power supply should be ample and power rates should be low enough to permit this portion of board cost to be in balance. Cost of power is also important in determining the type of equipment to be used.

Cost of labor is a large percentage of the expense of manufacturing board. Processes should be planned to operate with a minimum of labor. This labor cost will set to a large extent the size of mill as labor costs for low tonnage mills are usually higher than for the higher tonnage plants. Maintenance of


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When you buy a power saw you want to increase production—make more cuts per man-hour and reduce labor costs. You also want a saw that will give you increased production without increasing your accident rate. Here are some reasons why a Comet saw will give you *both* speed and safety.

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All Comet saw controls are in front and to the right of the operator. There's no awkward reaching over the saw assembly to make adjustments. Controls adjust quickly and smoothly for different cuts. You get increased production and added safety.

### FULLY RETRACTING ARM

The Comet radial arm retracts with the saw assembly, leaving the work area in full view. Layout marks are easier to follow—the saw blade can be seen at all times. Operator is not endangered by working around the obstruction of a fixed arm.

### BUILT IN SAFETY FEATURES

Comet's *exclusive safety return spring* protects operator—allows cut-off stroke to be pre-set—stops forward travel of saw blade and helps return saw assembly to starting position. Comet saw guards are *fully adjustable*—cover mandrel nut and most of saw blade for maximum safety. Positive anti kick-back dogs that grip work before it enters saw blade protect the operator when ripping. All control handles are large, easy to grip and lock the saw assembly firmly for safe, accurate cuts.

### OTHER FEATURES THAT MAKE COMET SAWS YOUR BEST BUY

The Comet radial arm rides on eight fully enclosed permanently lubricated ball bearing rollers. Precision ground bearing tracks assure smooth, easy operation. Heavy oiled felt wipers seal radial arm bearings from dirt and dust. All weather exposed parts are chrome or cadmium plated or heavily enameled to prevent rust. Power cables are protected by flexible metal conduit. Comet saw motors *give full rated horsepower* and provide 100% overload capacity.

With all these features, Comet saws cost *no more—yet do more work* and last longer. They require little maintenance—practically no parts replacement. Comets are your best buy! Over 50 different combinations to fit your individual needs. See your building machinery dealer or write for specific information.

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equipment is a large factor in computing labor costs.

**Other Factors**

Availability and type of labor, distance to markets and other minor considerations should be given careful study before a plant is built for making board. As in other paper mill type operations the plant once established should prove to be a permanent one if the present growth rate of soft and hardboard usage is a satisfactory criterion.

**The End**

---

"Guard all the freedoms of democracy as you guard your life, and never forget that to abuse them is to destroy them. Don't ask government to do anything you can do for yourself, and remember the bigger the government, the smaller the people." —Mrs. H. C. Houghton, President, General Federation of Women's Clubs


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"So your girl friend has a twin? How do you manage to tell them apart?"

"Easy, my girl has red hair and blue eyes and plays the zither."

"Yes."

"And her twin plays halfback for the Chicago Bears."

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*in NEW SIZES AND SHAPES*

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55 West 44th St.
New York 18, N. Y.

To Every Person Concerned
with Forest Products,

Greetings:

Forest Products Research Society invites you to attend its 1 9 5 1 Annual Meeting at Convention Hall Philadelphia, week of May 7-13.

A program of the widest possible interest has been prepared, in collaboration with the important Societies listed at the left, whose representatives comprise the Program Committee.

Members of all these societies known to be interested in any aspect of Forest Products are being sent advance Programs and Registration Forms.

Others interested may obtain this material by writing to:

Annual Meeting Program Committee,
Forest Products Research Society,
Room 47, Two Columbus Circle,
New York, 19, New York.

Looking forward to seeing you in Philadelphia in '51, I am,

Sincerely,

Roy M. Carter,

Program Chairman.

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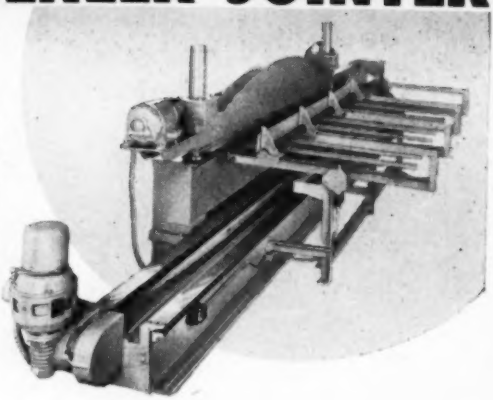

No chain feed—no stock wobble. It's the most accurate machine available for this type of work. Bundles of veneer up to four inches thick are firmly clamped in the machine. The jointing heads travel past the stock. Equipment includes four knife, round, roughing and finishing heads. Accessories such as swivel mounted roughing motor . . . mechanical loader . . . glue spreading attachment . . . head jointing attachment . . . dust piping . . . are readily available.

**6 SIZES:** 90", 102", 126", 150", 200", 212".

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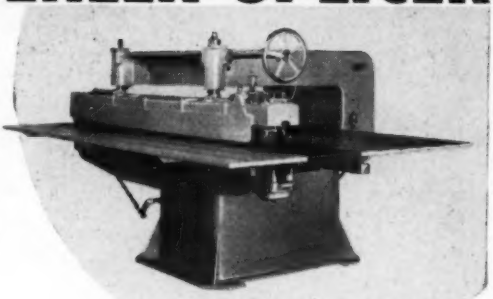

Precision tapeless joints — self-adjusting for varying thicknesses. About the only adjustment required by this machine is speed variation, regulated from 15 to 120 feet per minute. Either glue or catylist is applied smoothly and evenly by the revolving glue disc at the infeed end. Chains are self-cleaning.

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# *Plans and Purposes*

## FOR THE PHILADELPHIA F.P.R.S. CONVENTION AND SHOW

CONVERSION and Mobilization of the Wood Industries is the theme for the entire program of the 1951 Forest Products Research Society Annual Meeting at Convention Hall, Philadelphia, May 7-11. All of the technical sessions—co-sponsored by nine technical societies—will discuss problems found in meeting national defense mobilization. This event is claimed to comprise the most elaborate and extensive program of technical sessions ever attempted by the society. Those who attend will obtain a deeper understanding of the nature of the problems their industry is facing and will take home new strategies and tactics which may be applied to their own problems. All papers will be presented by recognized authorities in their respective fields.

Eugene R. O'Hare, Chairman of the International Industry Show reports that the Show will include exhibitors from foreign countries as well as the United States. The entire Show is being built around a unique integrated plan whereby primary machines will be shown in actual operation. Completely fabricated units will be manufactured continuously at modern high-speed woodworking machinery completely equipped with power transmission units, dust collecting systems, and automatic infeeding and outfeeding devices. Fabricated units will also be packed for shipment with modern packaging methods and equipment. A logging and sawmilling show has also been arranged to operate in conjunction with the Industry Show.

A continuous showing of forest products industries motion pictures in the large theater in Convention Hall will cover such subjects as: furniture manufacturing, finishing, furniture woods, woodworking machinery, millwork manufacture, plywood manufacture, wood research, etc.

Field trips have also been arranged to equipment, woodworking and wood treating plants in the area. Co-sponsoring societies, exhibitors and Convention Hall authorities are all cooperating to help make this an opportunity to show wood industries just what is available for defense and non-defense work.

In this report of the meeting, we have included a list of exhibitors, the complete program and abstracts from a few of the papers which will be presented. If you plan to attend the Show, be sure to visit booth No. 122 to say "hello" to

the WOOD WORKING DIGEST representatives there. We'll be glad to see you.

**Men Behind the Scenes**

Putting over the biggest national meeting and industry show in the history of the F.P.R.S., and probably the industry, is no small task even for this formidable array of executive and specialized talents. When nine leading wood industries societies combine their forces, along with those of armed forces experts to develop a current, vital technical program, plenty of teamwork is involved.

James F. Hamilton, F.P.R.S. President, and Manager, Laminating Operations, M. Murphy & Son, Ellicottville, N. Y., next to W. B. Wilkins, General Chairman of the combined meeting and show, is probably the man most responsible for the magnitude of the event. A founder of the Society, in 1947, and former Northeast Region board member, Hamilton has been working toward the coming May 7-11 Meeting at Philadelphia for four years.

Ray C. Du Brucq is president of the Association of Manufacturers of Woodworking Machinery, and will deliver one of the keynote papers on the up-to-date picture of machinery availability at this meeting. Du Brucq is an outstanding authority in the machinery field. For the past 10 years he has been vice-president and general manager of Crescent Machine Div. of Rockwell Mfg. Co. Since January he has added the task of special Washington representative of Rockwell's entire Power Tool division to his other duties. He is an important and dynamic speaker.

**Eugene O'Hare**
**Show Chairman**

**James F. Hamilton**
**F.P.R.S. President**

**Roy M. Carter**
**Technical Program**

**W. B. Wilkins**
**General Chairman**

E. Sigurd Johnson, authority on furniture design and manufacture, both as a consultant and professor at North Carolina State College, is coordinating the A.S.M.E. co-sponsored session. Johnson is both an author and speaker on a wide range of wood subjects before F.P.R.S. groups. Some of his most recent work has been in the field of electronic wood sorting.

R. H. Bescher, F.P.R.S. Northcentral Regional board member, and vice-president of A.W.P.A. is coordinating the latter's co-sponsored session. Bescher is both author and authority in the field of wood preservation, and is Manager, Technical Dept., Wood Preservation Div., Koppers Company.

L. J. Markwardt, president of the American Society for Testing Materials, needs little introduction to the wood industry. Assistant Director of the U.S. Forest Products Laboratory, Madison, Wisconsin, widely-known author and lecturer, Markwardt will chairman the A.S.T.M. co-sponsored session. Some of his most current work is in the field of wood sandwich core construction, particularly for the armed forces.

Fred E. Dickinson is representing the S.A.F., of which he is also secretary, forest products division. Dickinson teaches logging, lumbering and seasoning at Yale, and is currently Chairman, F.P.R.S. Northeast Section.

Eugene R. O'Hare is the sparkplug behind the International Industry Show at Convention Hall, May 7-11. O'Hare is a technical expert on adhesives and woodworking machinery; and at present is doing consultant work in Washington, D.C.

Fred C. Simmons, one of the most highly-rated specialists in the logging and primary lumber industry, is also chairman of the Logging and Sawmilling Show committee. He is with the U.S. Northeast Forest Experiment Station at Upper Darby, Pa.

Lyman W. Wood is the committtee coordinator for the A.S.T.M. co-sponsored session. An engineer with the U.S. Forest Products Laboratory, Wood has written considerably in the field of construction materials related principally to concrete and wood.

R. C. Fraunberger is Chairman of the Motion Picture program at the national meeting. Technical pictures will run continuously throughout the six days. Fraunberger is Vice-president and General Manager of Southeastern Industries, Philadelphia, of the Philco Corporation. He is also chairman of the Northeast Section Education Committee.

Rudolph Willard, consulting engineer, Ridgewood, N. J., is Finance Chairman for the '51 meeting. Willard has delivered papers before both national and section F.P.R.S. meeting and has been active in the Northeast.

One of the most difficult, and key-assignments has been held by Paul Graham, woodworking consultant, of Manchester, N. H. Graham is Public Relations Chairman of the meeting, a job for which he is well-suited, being a notable writer of technical articles for the woodworking press.

Many additional committee members, Norman Bye of Disston Mfg., Philadelphia, Chairman of City Arrangements, and Charles Lockard, U.S. Northeast Forest Experimentation Station, Chairman of Plant Tours, round out the F.P.R.S. meeting and show committees. Added representatives of co-sponsoring societies include: Howard W. Morgan, Weyerhaeuser Timber, representing the American Paper and Pulp Association; E. L. Heermance, the Northeastern Wood Utilization Council; Charles B. Hemming, U.S. Plywood Corp., the Society of the Plastics Industry; and Jay M. Stevens, Dept. of the Navy.

**Exhibitors**

Complete listings of exhibitors were not available as we went to press. However, among those firms exhibiting will be:

Allington & Curtis
Saginaw, Mich.

American Cyanamid Co.
New York, N. Y.

American Society Testing Materials
Philadelphia, Pa.

Bakelite Corporation
New York, N. Y.

The Borden Company
New York, N. Y.

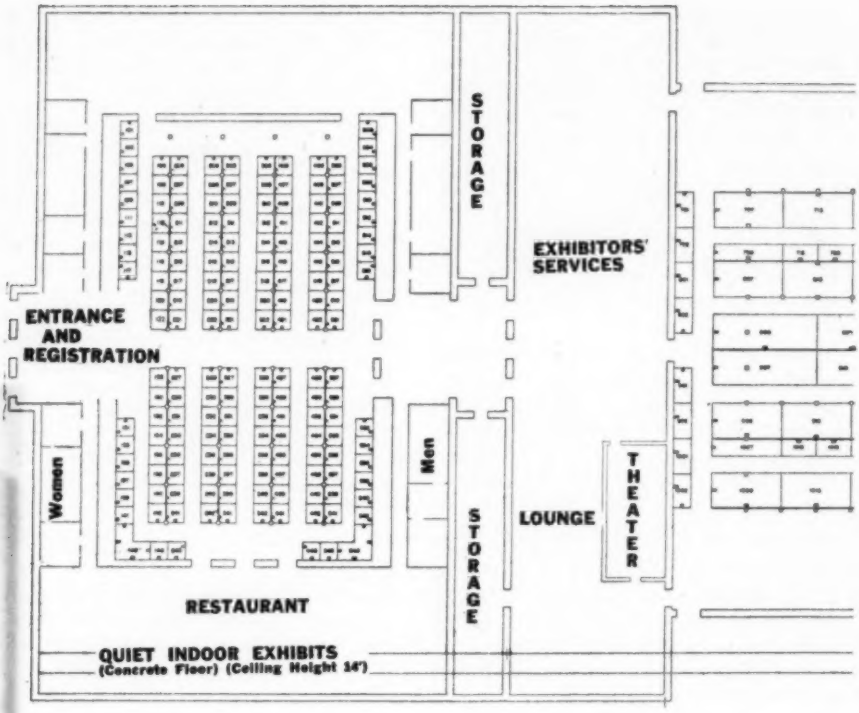
Bucknam Saw Grinder Mfg. Co.
Fort Erie, Ontario, Can.

Catalin Corp. of America
New York, N. Y.

Chevrolet Motor Div.
Detroit, Mich.

Como M. & T., Bjerk
Stockholm, Sweden

Curtis Machine Co.
Jamestown, N. Y.




Delmhorst Instrument Co.
Boonton, N. J.

Delta Equipment Co.
Philadelphia, Pa.

Deluxe Saw & Tool Co.
Chicago, Ill.

DeWalt, Inc.
Lancaster, Pa.

Disston & Sons, Inc., Henry
Philadelphia, Pa.

Durez Plastics & Chemicals, Inc.
North Tonawanda, N. Y.

Econaway Mfg. Co.
Bellevue, Mich.

Ekstrom-Carlson & Co.
Rockford, Ill.

Electronic Heating Corp.
Newton Highland, Mass.

Elmendorf Research, Inc.
Chicago, Ill.

Enterprise Sawmill Co.
Columbiana, Ohio

Firth Sterling Steel & Carbide
McKeesport, Pa.

Forest Products Research Society
Madison, Wisconsin

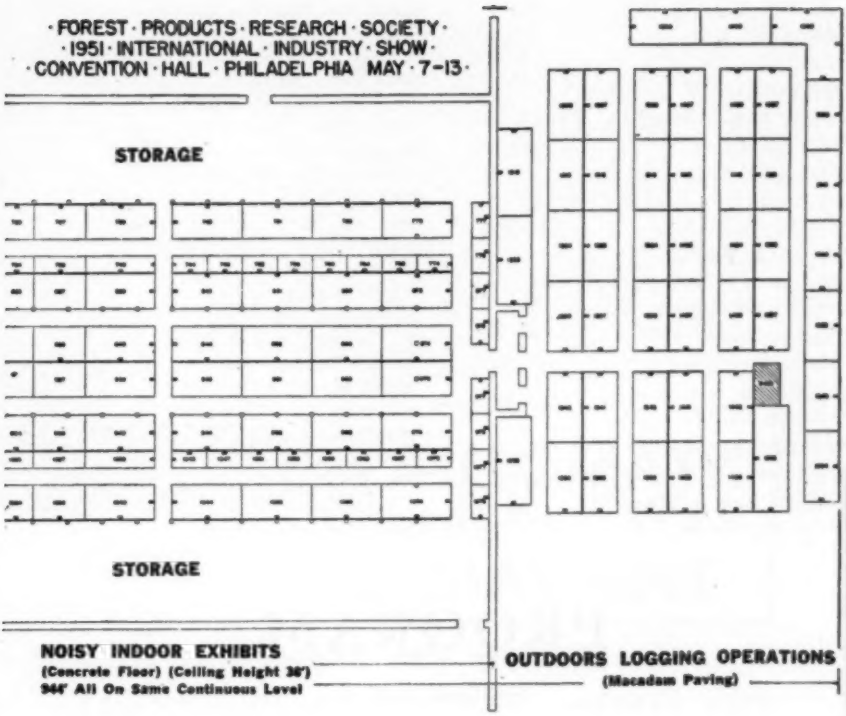
Greenlee Brothers & Co.
Rockford, Ill.

Hart Woodworking Machine Co., Earle
Chicago, Ill.

Hawker Mfg. Co.
Dayton, Ohio

Homelite Corp.
Port Chester, N. Y.

I.E.L. Power Saws, Inc.
Seattle, Wash.




Kellogg Co., W. O.
Philadelphia, Pa.

Lemmon & Snoap
Grand Rapids, Mich.

McCulloch Motors Corp.
Los Angeles, Calif.

Maas & Waldstein
Newark, N. J.

Mall Tool Co.
Chicago, Ill.

Masonite Corp.
Chicago, Ill.

Media Machine Works, Inc.
Media, Pa.

Moak Machine & Tool Co.
Port Huron, Mich.

Moisture Register Co.
Alhambra, Calif.

Monsanto Chemical Co.
St. Louis, Mo.

National Casein Co.
Chicago, Ill.

Northeastern Wood Utilization
New Haven, Conn.

Onsrud Machine Works
Chicago, Ill.

Osgood Engineering Co.
Malden, Mass.

Perkins Glue Co.
Lansdale, Pa.

Pilot Chemical Co.
Long Island City, N. Y.

Production Machinery Co.
Greenfield, Mass.

Protection Products Mfg. Co.
Kalamazoo, Mich.
P.T.I. Inc.
New York, N. Y.
Proctor & Schwartz, Inc.
Philadelphia, Pa.
Red Lion Cabinet Co.
Red Lion, Pa.
Reed-Prentice Corp.
Worcester, Mass.
Reiner & Co., John
Long Island City, N. Y.
Rohm & Haas
Philadelphia, Pa.
Schrader & Son, A.
Brooklyn, N. Y.
Schramm, Inc.
West Chester, Pa.
Simonds Saw & Steel Co.
Fitchburg, Mass.
Smithway Machine Co.
Seattle, Wash.
Society of The Plastics Industry
New York 16, N. Y.
Standard Dry Kiln Co.
Indianapolis, Ind.
Timesavers, Inc.
Chicago, Ill.
Torit Mfg. Co.
St. Paul, Minn.
Walker-Turner, Inc.
Plainfield, N. J.
Westinghouse, Inc.
Pittsburgh, Pa.
Wolverine Finishes Corp.
Grand Rapids, Mich.
Wood Working Digest
Wheaton, Ill.
Wood Industries Div., A.S.M.E.
New York, N. Y.
Woodworking Precision Machine & Tool Co.
New York, New York

# PROGRAM

## SUNDAY, MAY 6

Registration at the Ben Franklin Hotel, convention headquarters

## MONDAY, MAY 7

Registration at Convention Hall.

10:00 A.M. Opening of F.P.R.S. International Industry Show

2:00 P.M. *Theme: Logging and Primary Processing*
Co-sponsor: The Society of American Foresters
Arranged by Fred E. Dickinson, Yale School of Forestry

PAPERS: LARGE VS. SMALL TRUCKS IN TIMBER HARVESTING, by Bruce Mety, Southern Lumber Company, Warren, Arkansas, and Donald Tufts, Assistant Logging Engineer, Crossett Lumber Company, Crossett, Arkansas.

CIRCULAR SAWMILLS IN THE TENNESSE VALLEY REGION, by Paul H. Lane, Forest Utilization Service, T.V.A., Norris, Tennessee.

QUALITY CONTROL IN LUMBER MANUFACTURE, by Dr. J. S. Bethel, A. C. Barfoot and Donald Stecher, School of Forestry, North Carolina State College, Raleigh, North Carolina.

USE OF GANGSAWS IN THE MANUFACTURE OF SOUTHERN PINE LUMBER,

Saddles or scoops any shape or size of chair seat.

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**Manufacturers of** Combination Horizontal and Vertical Boring Machines — Trimming, Chucking & Boring Machines — Single Drum Sanding Machines — Corner Block Machines — Chair Clamps — Notching Machines — Single End Tenoners — Bending Equipment (including Steam Boxes, Pumps, Benders) — Mortisers.

## McKnight Machinery Company

Chair and Woodworking Machinery

GARDNER, MASSACHUSETTS, U. S. A.

by E. E. Dargan and Lucas Dargan, Dargan Lumber Company, Conway, North Carolina.

POSSIBILITIES IN TROPICAL HARDWOOD PRODUCTION, by Robert W. Hess, Yale School of Forestry, New Haven, Connecticut.

## TUESDAY, MAY 8

9:00 A.M. *Theme: Mobilization of the Wood Industry*
Sponsor: Forest Products Research Society
Arranged by R. A. Hertzler, Southeastern Forest Experimental Station, Ashville, N. C.

PAPERS: MOBILIZATION REQUIREMENTS FOR WOOD, C. Arthur Bruce, Lumber and Wood Industries Division, National Production Authority, Washington, D. C.

RECENT DEVELOPMENTS AND AVAILABILITY OF LOGGING AND MILLING EQUIPMENT, by Harold E. Holman, Industry Operations Bureau, National Production Authority, Washington, D. C.

EFFECT OF THE DEFENSE PROGRAM ON THE AVAILABILITY OF WOODWORKING EQUIPMENT, by Ray C. Dubrucq, Vice President, Crescent Machine Division, Rockwell Manufacturing Company, and President, Association of Manufacturers of Woodworking Machinery, Washington, D. C.

MOBILIZATION REQUIREMENTS FOR TECHNICAL MEN IN THE WOOD INDUSTRIES, by C. D. Dosker, President, Gamble Brothers, Incorporated, Louisville, Kentucky.

12:00 "Welcome to Philadelphia" luncheon

2:00 P.M. *Theme: Wood Utilization in the Defense Program*
Sponsor: Forest Products Research Society
Arranged by: Jay M. Stevens, Department of Navy, Bureau of Aeronautics, Washington, D. C.

PAPERS: MILITARY REQUIREMENTS FOR WOOD IN PACKAGING, by Clinton K. Royce, Packaging Section, Office of Naval Material, Department of Navy, Washington, D. C.

LUMBER CONSERVATION IN MILITARY PROCUREMENT AND CONTAINER DESIGN, by James A. Sargeant, Chief, Packaging Development Branch, Engineering Research and Developing Branch, Department of Army, Fort Belvoir, Virginia.

WOOD REQUIREMENTS FOR SPECIALIZED USES, by F. T. Paden, Mechanical Products Section, Research and Development Branch, Military Planning Division, Office of Quartermaster General, Department of Army, Washington, D. C.

THE PLACE OF SMALL BUSINESS IN THE MILITARY PROCUREMENT PROGRAM, by Phillip G. Read, Procurement Policy Division, Office of Navy Material, Department of Navy, Washington, D. C.

MILITARY MARINE WOOD USAGE, by John G. Kuenzel, Bureau of Ships, Department of Navy, Washington, D. C.

SELECTING WHITE OAK FOR BENDING LUMBER, by Maxon Y. Pillow, Technologist, U. S. Forest Products Laboratory, Madison, Wisconsin. (By title only.)

## WEDNESDAY, MAY 9

9:00 A.M. *Theme: New Machinery, Machining and Production Methods*
(Two sectional meetings held concurrently)

# *Glue and Clamp was Right ...for Hepplewhite!*

**MODERN PRODUCTION GLUING CALLS FOR**

**Thermatron**

**HIGH FREQUENCY GENERATORS AND EQUIPMENT**

Seen in the jig is an entire cabinet assembly to be glue-set electronically by THERMATRON in only 30 seconds. The bond is stronger than the wood itself by actual test! Hidden in the background is the 3 KW generator which masterminds this job.

BACK IN LEISURELY 1775 when famed cabinet maker George Hepplewhite counted his weekly production on one hand, the old glue and clamp method did very well indeed.

*Nowadays* THERMATRON streamlines wood gluing departments. You can produce a lifelong bond electronically with THERMATRON equipment in less time than it takes to read about it. Used with specially designed jigs THERMATRON does away with expensive hand clamping . . . Sharply reduces spoilage of fine veneers. Frees your floor storage area for *production.*

With THERMATRON there is one contract, one responsibility. After the first units are installed, customers usually develop experience enabling them to produce their own jigs.

Let THERMATRON bond *your* product the modern way in "jig time." Outline your operation to us now so that we can make recommendations without obligation. Ask for bulletin WD-2.

Standard stock generators available from 500 Watt to 20 KW output, operating on 110 or 220 volt lines. Larger size generators up to 100 KW can be supplied for larger requirements.

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Co-sponsor: American Society of Mechanical Engineers
Arranged by: E. Sigurd Johnson, Industrial Engineering Department, North Carolina State College, Raleigh, N. C.

PAPERS: SOME ASPECTS OF WOOD MACHINING STUDIES, by L. A. Patronsky, School of Natural Resources, University of Michigan, Ann Arbor, Michigan.
WHERE AND HOW TO USE AND MAINTAIN CARBIDE CUTTING TOOLS IN THE WOOD INDUSTRIES, by Don Flinchbaugh, Redco Tool Division, Red Lion Cabinet Company, Red Lion, Pennsylvania.
QUALIFICATION OF MACHINES FOR HOLDING CARBIDE-TIPPED SAWS, by E. T. Rothley, Big Four Carbide Tool Company, Cincinnati, Ohio.

9:00 A.M. *Theme: Wood Preservatives and Treatment Related to Defense*
(Two sectional meetings held concurrently)
Co-sponsor: American Wood Preservers Association
Arranged by: R. H. Bescher, Wood Preserving Div., Koppers Co., Inc., Orrville, Ohio.

PAPERS: PRODUCTION AND USE OF FIRE-RETARDANT TREATED LUMBER, by H. W. Angell, American Lumber and Treating Company, Chicago, Illinois.
WOOD PRESERVATIVES IN THE NATIONAL EMERGENCY, by George M. Hunt, Former Director, U. S. Forest Products Laboratory, Madison, Wisconsin.
THE BROADER ASPECTS OF WOOD PRESERVATION WITH PARTICULAR REFERENCE TO CREOSOTE, by Dr. James N. Roche, Koppers Company, Inc., Tar Products Division, Pittsburgh, Pennsylvania.

10:30 A.M. F.P.R.S. International Industry Show Exhibitors' Day

7:30 P.M. F.P.R.S. Banquet and President's Reception

## THURSDAY, MAY 10

9:00 A.M. *Theme: Utilization and Conversion of Woods and Mill Scrap*
(Two sectional meetings held concurrently)
Co-sponsor: American Paper and Pulp Association
Arranged by: Howard W. Morgan, Pulp Division, Weyerhaeuser Timber Company, Tacoma, Washington.

PAPERS: MANUFACTURE AND UTILIZATION OF HIGH QUALITY CHEMIGROUNDWOOD PULPS FROM HARDWOODS, by Paul M. Schaffrath, New York State College of Forestry, Syracuse, New York.
UTILIZATION OF SAWMILL WASTE FOR PRODUCTION OF CHEMICAL PULP, by R. M. Hammond, Tacoma, Washington.
FIBER PRODUCTS FROM WASTE WOOD, by Armin Elmendorf, President, Elmendorf Research Incorporated, Chicago, Illinois.
THE EFFECT OF STORAGE OF SLASH PINE PULP WOOD ON SULPHATE AND GROUNDWOOD PULP QUALITY, by J. N. McGovern, J. S. Martin and A. Hyttenen, Division of Pulp and Paper, U. S. Forest Products Laboratory, Madison, Wisconsin.
DETERIORATION OF SOUTHERN PINE PULPWOOD DURING STORAGE, by Dr. Ralph M. Lindgren, Division of Pathology, Bureau of Plant Industry, New Orleans, La.

# ARE YOU IN ANY ONE OF THESE 3 GROUPS?

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- ☐ I have made some use of compressed air for woodworking but do not know all of its possibilities.
- ☐ I know nothing about the application of compressed air to woodworking.

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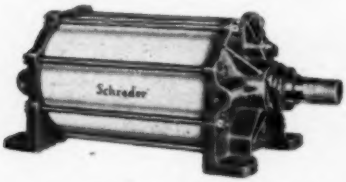


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9:00 A.M. *Theme: Training Men for the Wood Industries*
(Two sectional meetings held concurrently)
Sponsor: F.P.R.S. — Forest Products Education Subject Matter Committee
Arranged by: R. A. Hertzler, Southeastern Forest Experiment Station, Asheville, N. C.

PAPERS: WHAT DOES THE FOREST PRODUCTS INDUSTRY EXPECT FROM COLLEGE-TRAINED MEN; Views of the Lumber Industry, by Roy Dingman, Weyerhaeuser Timber Company, St. Paul, Minnesota.
WHAT DOES THE FOREST PRODUCTS INDUSTRY EXPECT FROM COLLEGE-TRAINED MEN; Views of Wood Fabrication Industry, by Clyne Crawford, President, Crawford Furniture Manufacturing Company, Jamestown, New York.
INDUSTRIAL ORIENTATION AND ON-THE-JOB TRAINING PROGRAM FOR NEW TECHNICAL EMPLOYEES, by G. Maurice Hill, Assistant to President, Drexel Furniture Company, Drexel, North Carolina.
THE SCOPE AND OBJECTIVES OF COLLEGE TRAINING, Views on Undergraduate Training by Dr. F. H. Kaufert, Chief, School of Forestry, University of Minnesota, St. Paul, Minnesota; Views on Graduate Training by Dr. E. S. Harrar, School of Forestry, Duke University, Durham, North Carolina.
PANEL DISCUSSION OF FOREST PRODUCTS TRAINING AND EDUCATION

2:00 P.M. *Theme: Wood Fuel*
(Two sectional meetings held concurrently)
Co-sponsor: Northeastern Wood Utilization Council
Arranged by: Edgar L. Heermance, New Haven, Conn.

PAPERS: HARVESTING FUELWOOD IN STICK FORM, by Fred C. Simmons, U. S. Forest Utilization Service, Northeastern Forest Experiment Station, Upper Darby, Pennsylvania.
SOURCE AND AVAILABILITY OF CHIPPED WOOD FOR FUEL, by R. R. Alexander, Carthage Machine Company, Carthage, New York.
USE OF CHIPS IN GRAVITY FEED STOVES, by John W. Allen, Institute of Forest Products, University of Washington, Seattle, Washington.
CHIPPED WOOD FOR LARGE BOILERS AND INTERCHANGEABLE SPREADER STOKERS, by E. C. Miller, Riley Stoker Corporation, Worcester, Massachusetts.
BRIQUETS FROM SAWDUST, BARK AND OTHER WASTE, by Walter W. Letts, Northville, New York.
CHARACTERISTICS OF WOOD AS FUEL, by R. H. P. Miller, U. S. Forest Products Laboratory, Madison, Wisconsin.

2:00 P.M. *Theme: Testing and Evaluation of Forest Products*
(Two sectional meetings held concurrently)
Co-sponsor: American Society for Testing Materials—Commitee D-7 on Wood
Arranged by: Lyman W. Wood, U. S. Forest Products Laboratory, Madison, Wis.

PAPERS: TESTS AND PROPERTIES OF TROPICAL WOODS, by F. F. Wangaard, Yale School of Forestry, New Haven, Connecticut.
SOME COMPARATIVE CHARACTERISTICS OF SECOND-GROWTH AND OLD-

# "JOB STEALER"...that's what they're calling the versatile Greenlee Double-End Tenoner

Yes, many plants today using the GREENLEE Double-End Tenoner on many, many more operations than originally planned for when this equipment was purchased. For, as "a woodworking plant in itself," it literally reaches out after extra work . . . steals job after job from single-purpose machines, often making them unnecessary. With its easily-applied attachments the GREENLEE performs *15 separate operations* swiftly, accurately . . . even processes serpentine and other irregular shapes. Thus, one machine alone does scores of different and difficult woodworking jobs . . . brings about untold new efficiencies and welcome cost reductions. Write for Bulletin 545, Greenlee Bros. & Co., 1865 Twentieth Avenue, Rockford, Illinois.

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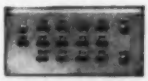

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GROWTH REDWOOD, by Bensen H. Paul, Chief, Division of Silvicultural Relations, U. S. Forest Products Laboratory, Madison, Wisconsin.
FATIGUE OF WOOD AND GLUED JOINTS AS USED IN LAMINATED CONSTRUCTION, by Wayne C. Lewis, Engineer, Division of Timber Mechanics, U. S. Forest Products Laboratory, Madison, Wisconsin.
EVALUATING WOOD PRESERVATIVES, by J. Oscar Blew, Jr., and R. H. Baechler, U. S. Forest Products Laboratory, and C. Audrey Richards, Division of Forest Pathology, Bureau of Plant Industry, Soils and Agriculture Engineering, Madison, Wisconsin.
THE CHEMICAL COMPOSITION OF EIGHT TROPICAL WOODS AS INDICATED BY PROXIMATE ANALYSES, by Louis E. Wise, R. C. Rittenhouse, and Consuelo Garcia, the Institute of Paper Chemistry, Appleton, Wisconsin.

## FRIDAY, MAY 11

9:00 A.M. *Theme: Glues and Gluing — Getting Better Results with Present Materials*
Co-sponsor: Society of the Plastics Industry
Arranged by: Charles B. Hemming, U. S. Plywood Corp., New York, N. Y.

PAPERS: GLUE LINE DOCTOR, by Alan A. Marra, Research Engineer, School of Natural Resources, University of Michigan.
HOW TO CONTROL GLUE BOND QUALITY, by H. K. Phinney, Bakelite Division, Union Carbide and Chemical Corporation, Bloomfield, New Jersey.
MACHINING, HANDLING, FLOW OF MATERIALS, AND CONTROL IN GLUING, by George W. Stanley, Jr., Pressed Steel Car Company, Chicago, Illinois.
RESEARCH IN ELECTRONIC WOOD GLUING, by John Yarvorsky, Research Technologist, New York State College of Forestry, Syracuse, New York.
ADHESIVES DEVELOPMENTS AND SUPPLIES FOR DEFENSE, by N. V. Poletika, Timber Engineering Company, Washington, D. C.

11:00 A.M. *Theme: Handling, Seasoning and Kiln Operations*
Meeting of the Keystone Dry Kiln Club

PAPERS: Additional, by Title Only:
PROPERTIES AND CHARACTERISTICS OF BRAZILIAN PARANA PINE, by Maxon Y. Pillow, Technologist, Division of Silvicultural Relations, U. S. Forest Products Laboratory.
NAILS AND SCREWS IN WOOD ASSEMBLY AND CONSTRUCTION, by Dr. E. George Stern, Virginia Polytechnic Institute, Blacksburg, Virginia.

**Abstracts To Be Presented**

Following are resumes of several papers which will be presented, among others, at the Fifth Annual Meeting. WOOD WORKING DIGEST will publish some of these papers in later issues.

**Machining, Handling, Flow of Materials and Control in Gluing,** George W. Stanley, Jr., Chief Engineer, Hegewisch Div., Pressed Steel Car Co., Inc., Chicago, Ill.

In this paper, which deals with the problems presented in the machining, handling, flow of materials and control in gluing, some common errors—both in design and in practice—are pointed out, and the importance of correct timing in the sequence of the operations is

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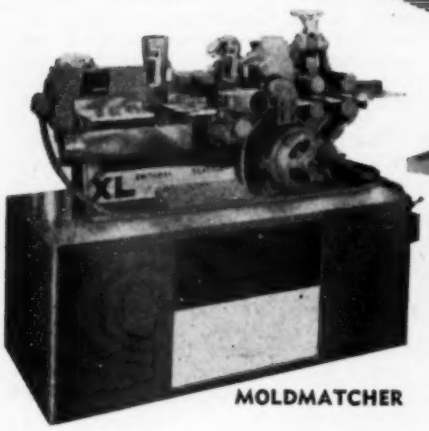
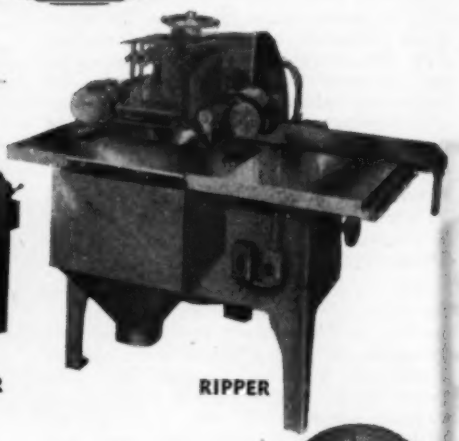



MOLDMATCHER



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emphasized. Indiscriminate mixing of specie, lack of proper seasoning time, and shortcutting of proper machining operations are all things to be avoided. The value of humidity control is emphasized in the overall picture.

**Research in Electronic Wood Gluing,** John M. Yavorsky, Research Assistant, College of Forestry, New York University, Syracuse, N. Y.

Many of the physical factors affecting electronic wood gluing have been evaluated in recent years. However, the electrical behavior of the wood, the glue and the wood-glue combination has not been adequately established. The important basic electrical relationships are discussed, and the results of exploratory studies of these characteristics are given.

**Production and Use of Fire Retardant Treated Lumber,** H. W. Angell, Wood Technologist, American Lumber & Treating Co., Chicago, Ill.

The pressure treating of lumber to increase its fire resistance, which began in the United States in the 1890's, greatly expanded during World War II. Aside from the stimulus brought by war, peace time fireproofing is expected to expand because of the development of suitable large-scale fire tests and their acceptance by building officials and building code committees as criteria for the acceptance of building materials for use in given locations. Service records for fire retardant lumber are gradually accumulating. It may not be long before the insurance underwriters will seriously review the entire field of fireproofed lumber with respect to reduced insurance rates.

**Military Marine Wood Usage—Marine Laminating,** John G. Kuenzel, Senior Materials Engineer, Forest Products Research Division, Bureau of Ships, Navy Department, Washington, D. C.

Strength and durability required to withstand destructive forces and organisms of the sea differ from requirements necessary to withstand forces encountered on land or in the air. Wood continues to be an important ship building material and a source of supply of choice structural timbers is assured as a result of laminating techniques developed by American ingenuity.

The size and quality requirements of wood ship board members is being solved by laminating. The technology of wood preservation is challenged to solve the problem of supply wood resistant to deterioration.

**Effect of the Defense Program on the Availability of Woodworking Equipment,** Ray C. DuBrucq, President, Association of Manufacturers of Woodworking Machinery, Vice President, Crescent Machine Division, Rockwell Manufacturing Co.

The need for wood producing equipment is particularly acute during the limited hostilities we are engaged in today—hostilities which may flare up into full-scale war at any time. Throughout the last war period, 1942-1945, the demand of the defense program on woodworking machinery was 100 percent over the demand during the 1937-1942 period. From 1946 it was 120 percent higher than through the World War II period, or 4½ times the average usage during the 1937-1942 period.

During World War II we were forced, through priority demand, to neglect normal users of woodworking machinery. They were forced to convert plants to defense, with very little normal wood products manufactured. With the end of the war and a total rescinding of priorities, the machinery industry was flooded with orders to replace old ma-machines and enable keeping up with production of factories that had benefited through new machinery allowed them by the priority system. This equipment was then converted from war work to normal wood products manufacturing.

Our experience in this regard should emphasize that the woodworking machinery industry is a most important one in peace as well as in war time, and, as the Department of Agriculture has stated, is "A key component in the economic recovery of a nation after war."

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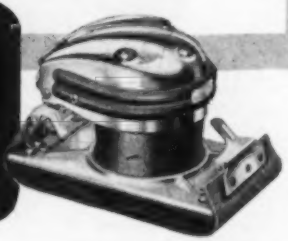

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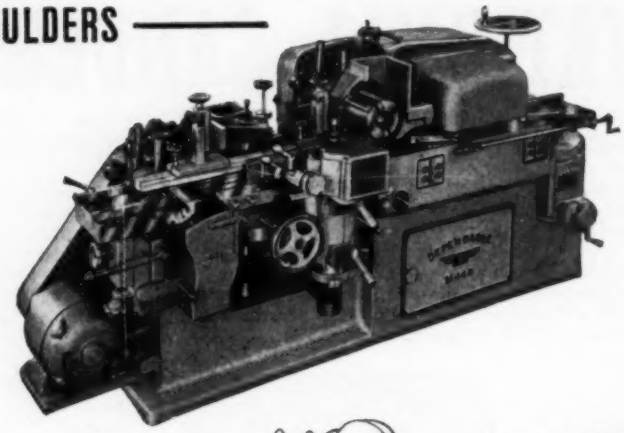
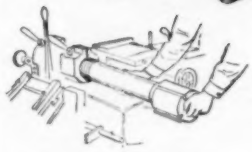
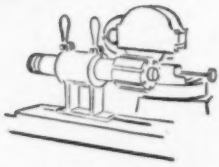
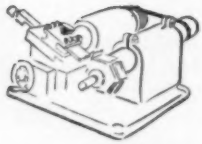




*Quick, easy removal of Cartridge Spindle Unit*



*Head being ground on Cartridge Spindle Unit*



*Head being jointed on Cartridge Spindle Unit*

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# Timber Vs. Iron

## FOREST CONSERVATION STRUGGLES FOR A FOOTHOLD IN EARLY ENGLAND

BY JOHN L. MORTIMER

**This interesting story of Early England's need for forest conservation has been published to emphasize again the importance of such programs. Our current "Keep Green" and "Tree Farm" programs are helping to keep America rich in natural resources. With summer months ahead of us—when forest fires are more common than in the winter—we need to redouble our own efforts to "Keep America Green."**

THE YEAR 1869 appears to have marked the end of the era when forests were depleted to provide charcoal for the manufacture of furnace iron. That year in America the quantity of pig iron made with bituminous coal and coke first exceeded the amount made with charcoal. Almost immediately the use of charcoal in furnace iron-mongering began to decline, and in only a relatively few years disappeared. But the end of the charcoal era in iron making was accomplished so silently that it did little justice toward illuminating the end of one of the most unusual struggles in history, the struggle between the developers of natural resources and the preservers of the natural domain.

Most of the history was English history, and it involves the romance of the English forests, from times long before Robin Hood of Sherwood, to the Spanish American war which marked finally the end of the wooden navies of the world.

The great struggle between forest protectors and the iron manufacturers lasted about 400 years but it produced some profound incidents.

The record is replete with curious historical sidelights, political, scientific, financial, botanical. For instance, here is a recipe on preparing the site for cooking up a batch of iron-furnace charcoal, as outlined by John Evelyn in the Royal Society in London in 1663, in "response to queries received from the Royal Navy:"

"The best wood is good oak, cut into lengths of three feet, as they size it for the stack. This is much better than cord wood, though of a larger measure, and much us'd in Sussex. The wood cut, and set in stacks ready for the coaling, chuse out some level place in the copse, the most free from stubs, etc., to make the Hearth on: In the midst of this area drive down a stake for your center; and with a pole, having a ring fastened to one of the extremes (or else with a cord put over the center) describe a circumference from twenty, or more, feet semi-diameter, according

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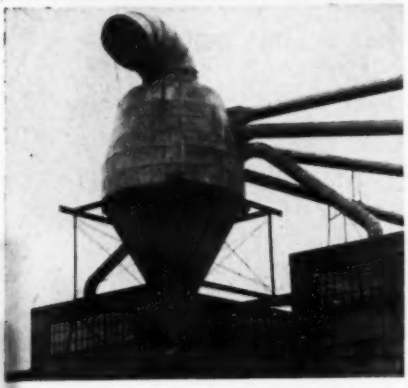

Large cyclone collector is part of Dixie installation at Ox Fiber Brush Co., Frederick, Md.

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to the quantity of your wood designed for coaling, which being near may conveniently be charked in that Hearth."

John Evelyn was only a figure in the natural history of England, but his studies had some marked and beneficial effects. They brought about movements to replant the forests of England, and actually these movements became great crusades which are responsible for the quality of the forests in England today. In Evelyn's day—that is, after the ascension of Charles II to the throne of England — British forests had been largely denuded of heavy usable timber, and the point had been reached where the nation must enlist the aid of its subjects in rectifying the situation for the benefit of future generations, or suffer the consequences thereof. In the great battle to reforest the Isles, the iron mongers got most of the credit for having caused the difficulty, right or wrong, and it was primarily against the iron works that vigorous action was taken in the 200-year span of the 1500's and 1600's.

In 1558 and again in 1585, the parliaments of Queen Elizabeth acted to preserve the British Isles against indiscriminate leveling of the forests. Although a substantial portion of the damage undoubtably was the work of timber speculators, Parliament was able to act swiftly and effectively against the iron makers. In this action, little attention appears to have been paid to the greatly increasing demands for iron. The iron furnace owners were small tradesmen, the forest owners were as a rule titled aristocrats with an easy berth in the Royal Navy's wooden ships. In the great political battles over the timber and iron industries, there is no evidence of great concern over the circumstances involving the home life or livelihood of the lowly English farmer and herdsman.

In the first year of Queen Elizabeth's

reign, 1559, Parliament adopted an act that "timbre shall not be felled to make Coales for the burnynge of yron." The terms were specific and exacting.

In 1585, in the twenty-seventh year of Queen Elizabeth's reign, Parliament acted again, this time at great length and more specifically, to make the preservation laws also applicable to the wilds of Sussex, Surrey and Kent. In the long process, Parliament undertook to prevent the hewing of timbers for iron making at any point within 14 miles of the ocean or of the bank of any navigable river, and the action was taken upon direct representation of the Royal Navy, which had slowly come to realize that its timber reserves were inadequate to meet the demands of Empire protection.

Even with parliamentary action in 1585, one hundred years later Samuel Pepys was attempting to explain to the public that the import of timber for the Royal Navy was required, on the basis that a suitable supply of good oaken planks to keep the Navy afloat could no longer be obtained in England. The use of timber, even for fuel, anywhere in the land was forbidden if that timber was suitable for shipbuilding.

In such a situation it was easy to point the finger of guilt at the fast expanding iron furnaces, which claimed that each required at least four square miles of timber constantly for its maintenance. There was still virgin forest at the beginning of the 17th century in both Scotland and Ireland, but in that immediate period speculators descended upon the Scottish preserves and the Irish iron makers rushed to set up their furnaces right in the heart of the great pine groves.

With the people demanding action, the political forces of England proceeded to act. To understand that action, it is necessary to go back into history.

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English forests throughout the ages have figured strongly in the great affairs of state. As long back as the Roman conquest of the British Isles there is recorded attention to the methodical destruction of English forest. Perhaps in the time of Christ there was widespread leveling of forest areas in Southern England for the production of charcoal—which even in that era was used in the production of iron.

Actual historical attention to the great forests of England has been especially noted from about 400 B.C. During that period the Saxons, who had occupied the river valleys, began to drive the native Celts from the upland chalk ledges, and as they drove the Celts before them they waged a punitive war against the forests—ever clearing more land for extension of their farm areas. This "disafforestation" has continued on down to the modern era. The dangers were recognized by William the Conqueror, following the Norman Invasion of 1066 and in those generations Royal forests—actually woodland preserves—came into existence. For two centuries the preserves were maintained, often accompanied by great hardship for the English farmer or shepherd. The Royal forest system was followed by a swing of the pendulum in the direction of forest clearing — even forest burning. The Middle Ages saw the Anglo Saxons win communal rights in the forest lands, only to lose these rights through the Enclosure Acts of the 1700's and 1800's.

From Norman times, English forests became smaller and smaller. Sherwood of Robin Hood's day would probably have been a rather sorry place to hide by the turn of the 14th Century when England actually turned to the importation of lumber. This seemed odd in a nation whose borders had encompassed a treasure house of oak, elm, beech, ash, chestnut, walnut, maple.


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John Evelyn, in 1663, was probably the first human to speak of the "iron age," because he attributed the decline of the forests to the great need for charcoal to fuel the furnaces of the Cromwell armies. Actually, he did not blame the furnaces entirely for the timber depletion but his studies drew attention to them. Apparently the Cromwellian era brought about great increases in the use of iron, since Evelyn, writing in the days of Charles II, was careful to heap maudlin praise upon the king and villify Cromwell, while alluding to the "age of iron" just preceding the reign of Charles II.

The Act of 1585 brought to a head the timber matter. The erection of new furnaces was banned, and, indeed, the use of timber in the old mills greatly curtailed. A system of severe fines was set up, and as a parting shot at the iron-mongers, Parliament established a scale of indemnities the furnace owners would have to pay to use the roads.

Evelyn concurred in the purpose of the earlier laws, in fact he suggested that: "the exorbitance, and increase, of devouring iron mills be looked into, as to their distance, and number near the seas or navigable rivers."

Evelyn speculated that " 'twere better to purchase all our iron of America than thus to exhaust our woods at home."

The battle between the timber champions and the English iron-mongers did little to increase Britain's supply of timber for the Royal Navy but it did accentuate the need for more careful study of the problem and for suggestions to save the native stands. It further established John Evelyn as an authority on forests and brought him wide attention throughout England. In the latter circumstance the result was


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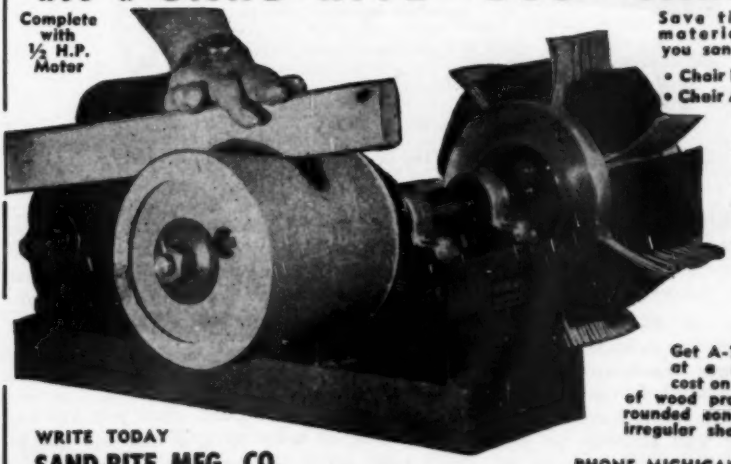

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beneficial since Evelyn's suggestions were in the main good. The English squires took his advice and began to replant for future generations.

Especially in the 1600's was tree planting a national issue. All varieties of trees were planted, especially in Southern England. In many areas, land that ordinarily would have been cleared for farming was allowed to maintain some 12 to 14 oaks per acre for the shipbuilding industry.

In the 18th century prizes for tree planting began to appear, and have continued on down to the present, even though the use of timber for ironmongering disappeared almost a hundred years ago.

**The End**

Middle age occurs when you are too young to take up golf and too old to rush up to the net.

**—Franklin P. Adams.**

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Extension of the staggered tooth principle, feature of Disston's Bite-Rite brand of files for many years, to its entire line of double-cut files, and improvements in the design of its taper files have been announced by Henry Disston & Sons, Inc., manufacturer of saws and other cutting tools.

Introduction of the original staggered tooth file meant that files could be operated on the principle of cutting rather than scraping. Overlapping teeth mean a smoother cut; undercut teeth result in faster removal of chips; and the open gullets give a long life to the files, we are told.

At the same time the Company announces that its single-cut taper files have been improved and strengthened on the edge by a change in design.

Further information on Disston Products is available from the Company, Dept. WD, 495 Tacony, Philadelphia 35, Pa.

# WOODEN you like to know

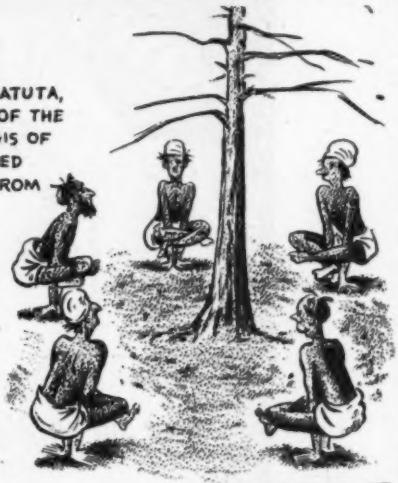
QUICK FACTS ON CYPRESS

FROM THIS SERIAL STORY OF HARDWOODS BY

THE ATLANTIC LUMBER CO.

## FOUNTAIN OF YOUTH!

ACCORDING TO IBN BATUTA, MUSSULMAN TRAVELER OF THE 14th CENTURY, THE YOGIS OF CEYLON, INDIA, BELIEVED THAT EATING A LEAF FROM A CERTAIN SACRED CYPRESS WOULD RESTORE THEIR VIGOR AND YOUTH... SO THEY SAT AROUND THE TREE IN A CIRCLE WAITING FOR LEAVES TO DROP!



## OLDEST LIVING THING!

IN THE VILLAGE OF SANTA MARIA DEL TULE, OAXACA, MEXICO, IS A CYPRESS THAT MANY CLAIM IS THE OLDEST LIVING THING ON EARTH. IT IS BELIEVED TO BE 5,000 OR MORE YEARS OLD!

## GIFT FROM NAPOLEON!

ON THE GROUNDS OF THE JUMEL MANSION IN NEW YORK CITY IS A GROUP OF CYPRESSES GIVEN TO THE ORIGINAL OWNER BY NAPOLEON, WHO IMPORTED THEM FROM EGYPT.

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# *Know your wood*

## CYPRESS

**(Taxodium distichum)**

BY NED BAILEY

CYPRESS is known under different names, such as Gulf cypress, Louisiana red cypress, Tidewater red cypress, yellow cypress, white cypress, black cypress, Arizona cypress, Bald cypress and Monterey cypress. All refer to the same species (taxodium distichum). The Forest Service recognizes only one other species of cypress which they call "pond cypress," but its infrequent occurrence and small size eliminate it from general commercial use.

The scientific name taxodium comes from its resemblance to the yew or taxus, while distichum is from two Greek words meaning twice or double ranked, and refers to the two-ranked arrangement on the twigs of the long, narrow rather flat leaves. These are one-half to three-quarters of an inch long, light yellow green, arranged spirally on the twigs, and feathery in appearance, they turn yellow or brown before they drop in the autumn. Cypress grows from seed and also sprouts freely from the tree stumps during the first fifty to one hundred years.

Cypress is generally equally at home on land or in the water, lifts a massive, buttressed tapering trunk, surrounded by curious cone-shaped knobs, above the stagnant water of southern swamps or river bottoms ofttimes carrying a crown laden with drooping locks of Spanish moss. This species of tree, remnant of ancient times when similar trees were distributed over North America and Northern Europe, is making its last stand in the Southeastern states, where it grows along the coast from southern Delaware to southern Florida, westward along the Gulf coast into Texas, and northward up the river valleys through Oklahoma and Arkansas to southern Illinois and southern Indiana. Usually it occurs along low bottomlands in saturated, or seasonally submerged soil. Thousand-year-old trees may become 150 feet high and 12 feet in diameter, but more often they approach 120 feet in height and 3 to 5 feet in diameter. Although a conifer, it is not evergreen, as its leaves and small immature twigs are shed each fall.

There is some confusion as to whether cypress is a hardwood. Botanically, it is not, but since it grows in company with southern hardwoods, and is frequently manufactured along with these species, it is quite natural that many people do mistake it as one of them. Another reason for this confusion is that cypress is graded under the rules of the National Hardwood Lumber Association. The Southern Cypress Manufacturers Association also grade it, the rules of this organization however, apply particularly to that type of cypress known commercially as Tidewater red cypress while those of the National

Hardwood Lumber Association are applied to all types of the species.

Although swamps, river bottoms and sloughs are its natural habitat, yet for some reason handsome specimens may be seen, grown under cultivation in parks in nothern cities, with some of the largest ones growing in very dry situations.

The old timer has many singular and interesting characteristics, for example developing "knees" from the root system. These peculiar conical growths appear to have a certain value as a mechanical support for the tree. However, their principal function is the aeration of the root system through conductivity of oxygen. The wood in these knees is very soft, light and "punky" and, peculiarly enough, bears no similarity to the wood of the cypress trunk. The wood of cypress knees is used in the manufacture of novelties such as vases, decorative flower containers and souvenirs.

The knees are only one of the cypress' characteristics. The trunk is greatly swelled at the base, a habit which is shared by tupelo and other swamp grown species, but to a lesser degree. This massive trunk development is an extra support which compensates for the tree's precarious anchorage in the soft ground and water. Inasmuch as the wood from the swelled base of the cypress is not very desirable in common felling practice, the cut is made above the swelled portion.

Cypress has a reputation of being one of the most durable woods in America as far as the heartwood is concerned. The sapwood is not especially decay resistant under moist conditions, but for interior use it has many desirable qualities. Cypress wood is soft in texture and in old growth timber the grain is very fine, yielding a good percentage of highly prized red-


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dish heartwood. Cypress heartwood is rated as about the best in termite resistant qualities. Immediately after being cut cypress lumber is high in moisture content and the wood dries slowly, in fact more slowly than most other species. Due to its high original moisture content it shrinks considerably in drying, however it does not warp and check and can be depended upon to stay in place. In addition it will hold paint exceptionally well, which explains why cypress is one of the best woods for exterior trim, siding, porch flooring, etc.

Storage of chemical products is best handled in vats, tanks, reservoirs and troughs made of cypress because this wood has a natural resistance to the deteriorating effect of acids and corrosive solutions. At the same time cypress is safe to use in contact with foods, since it imparts no odor, taste or color, it is the outstanding wood for industrial tanks.

The uses of cypress are so numerous that three different sets of grades are needed to cover the requirements of all its consumers and to suit industrial and constructional demands. They are known as yard grades, factory grades and structural grades, providing a suitable grade for making tubs and pails—a grade for planking a boat or for making seats for a stadium. Tanks and vats seem to lead the demand for industrial purposes. Shipbuilders are important consumers right now, defense needs placing a heavy demand on cypress boat planking, barge material, piling and structural timbers. Factory equipment such as tobacco humidifiers, food processing containers, refrigerating equipment and laundry machines all use cypress. Agricultural supplies, such as poultry breeders, incubators, fruit and vegetable boxes, farm machinery parts, barrels and similar products require cypress. Lawn furniture, kitchen


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cabinets and cupboards and caskets are also made of this versatile wood.

Railroad and communication companies are large consumers of cypress for railroad ties, poles, bridge timbers, trestles, buildings, tanks and freight cars. A large percentage of the greenhouses constructed in eastern United States are cypress because of its resistance to decay—an important quality in such a warm humid atmosphere.

Much of the cypress used today is not painted or otherwise finished, since the wood will last almost indefinitely without protecting the surface, however, houses, barns, boats, in fact everything made of cypress will look better and last longer if it is painted. Cypress has many undiscovered possibilities particularly in the furniture field both the regular and the pecky type. We have seen several pieces recently where both had been used with most pleasing and different results.

**The End**

**I thought you said that last shipment was properly kiln dried!**


# DEFENSE ORDERS

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## AIR COMPRESSOR DRIVES

Up-to-date information on motor drives for all types of large air compressors is supplied in the new issue of the E-M Synchronizer No. 32. Fully illustrated, this bulletin contains tables, charts and graphs for matching motor characteristics to compressor requirements. Also given is a technical discussion of "Pr," "Synchronizing Power," and the various methods of motor and control protection for compressor installations.

Write the Electric Machinery Manufacturing Company, Dept. WD, Minneapolis 13, Minnesota.

## HOBBY CRAFTSMAN BOOK

Of special interest to any of our readers selling lumber or shop tools to the hobby trade is this book entitled "100 Beautiful Pieces of Furniture You Can Build." Written by the editors of "Popular Mechanics" in conjunction with John Bergen, furniture designer. Photographs, drawings, exact scale diagrams, step-by-step instructions tell the home owner how he can build his own furniture.

Order yours from Popular Mechanics Magazine, 200 East Ontario Street, Chicago 11, Illinois.

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# F.P.R.S. Clinic

## IS DISCOLORED LUMBER DECAYED?

**As a special service to our readers, this Forest Products Research Clinic has appeared in issues of WOOD WORKING DIGEST for the last several months. Similar problems will be discussed at the Fifth Annual Meeting of the Forest Products Research Society, May 7-13, at Convention Hall, Philadelphia. The answer to this month's problem has been provided by Carl Hartley, Bureau of Plant Industry Soils and Agricultural Engineering, Washington, D.C.**

Considerable needless alarm has resulted from mistaking relatively harmless discolorations for decay. It is true that decay that developed in the woods, or during processing, in its earliest stages sometimes reaches the manufacturer of products for which even incipient decay is disqualifying. But there are numerous discolorations due to staining fungi, bacteria or physico-chemical factors that have little or no significance beyond their effect on appearance. During our last two wars, there was much unnecessary rejection of harmlessly discolored but otherwise high-grade spruce, birch, maple, yellow-poplar and other wood because of the fear that it contained decay; in the poplar this was said to have amounted to 20 percent at the peak of the glider construction program. In general, in freshly hardwood cut timber only brownish or abnormally light colors indicate decay infections in these woods; the gray, greenish, pink or purple colors rarely constitute cause for rejection. On the other hand, wood that has stained or molded after cutting is to be regarded with some suspicion for uses in which strength is important since it has obviously been kept for a time under conditions that might have allowed decay fungi also to get started. Bleached areas in heavily stained wood are commonly specific indications that decay fungi have followed the stain fungi. Even before there has been perceptible softening, early stages of decay may involve material decrease in shock resistance.

---

One of the strongest barriers that could be erected against the growth of Socialism in the years ahead would be a generation of young citizens who had been well educated in the true values of the American private enterprise system. The longer we are obliged to have government controls and citizen regimentation in this state-of-war emergency, the more important it is that our school youngsters, as well as their parents, be imbued with unshakable faith in our institution of freedom.

**— George S. Benson**

## BUDDY POPPY SALE AIDS ALL VETERANS

Veterans of all our nation's wars receive direct and prompt aid from the annual national Buddy Poppy sale conducted by the Veterans of Foreign Wars, the proceeds of which are used exclusively to carry on the organization's extensive welfare and service program for veterans and their dependents and for survivors of veterans.

The 1951 Buddy Poppy sale, like those in the past, is primarily concerned with raising funds for three major phases of this program: local veteran welfare work, which consumes approximately two-thirds of the proceeds collected in each community; nationwide service and rehabilitation activities through the national and state organizations of the V.F.W.; and maintenance of the National Home for the children of deceased war veterans. The home on occasion, too, provides a haven for war widows.

If you give a dime for a Buddy Poppy to wear in your lapel on Memorial Day, here's exactly what that

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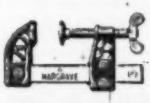
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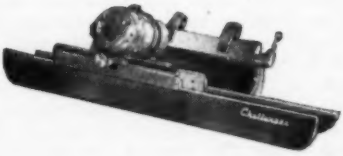

**BENCH TYPE**

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Complete specification in Folder F-10 on request.

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dime does. One cent of each Buddy Poppy dime goes to the V.F.W. national rehabilitation service. One cent goes to the National Home. One and one-half cents pay for the handiwork of the veterans, disabled and needy, who make the poppies in government hospitals throughout the country, the materials for making the poppies, and other necessary expenses. The rest of the dime stays right in the community where it was given.

### VERSATILE VISE

The Will-Burt Company shows the many uses for the Versa-Vise in a bulletin just released. Because it can be turned a full circle, whether mounted in the vertical or horizontal position, it can be used in planing, refinishing, boring, sawing, sanding, sharpening tools, filing, carving, welding, drill press work and other general woodworking jobs.

Write the above Company, Dept. WD, Orrville, Ohio.

## HELP FOR MANUFACTURERS

The paint industry has facilities that will help the prime or subcontractor who is planning to finish defense products according to government specifications. Before bidding on government work, the contractor should seek these facilities. They are available regardless of whether he has definitely selected his source of supply.

This advice was offered by A. D. Duncan, vice president of The Glidden Company of Cleveland, in charge of the paint and varnish division.

Duncan said that if the contractor intends to finish defense products he "will be wise to exercise the same care in selecting his finish and finish supplier as he does in meeting civilian requirements."

1. The finishing material he uses must conform with the government specification indicated in his contract. 2. It should function correctly and efficiently with the contractor's particular equipment. 3. The completed finish must pass government inspection.

"Government finish specifications rarely anticipate their use in high speed production," Duncan said. "They are designed primarily to control quality of finishes that are applied under unhurried conditions by military personnel during tranquil times. Many government specifications include drying requirements of 24 to 48 hours, for example, or a slow bake. Drying is only one of a number of variables that require special consideration and treatment.

"During emergencies, industrial producers must apply coatings for the military with the particular equipment they have and must cure them rapidly with existing drying facilities. Therefore, these coatings must often be specially tailor-made to meet each user's production requirements.

"Further complications arise from the fact that specifications for some finishes even define within narrow limits the permissible ingredients. Then it becomes a three-way problem of formulating within those limits, conforming to the performance requirements, and producing a coating that will function with the contractor's equipment.

"Solutions to such problems require technical paint skills and experience of a high order which reputable and established members of the paint industry are accustomed to provide.

"These services include such elements as custom-building the coating and assisting on all problems involved in production finishing."

Duncan cautioned the contractor not to "make the mistake of simply buying so many gallons of paint at so much per gallon." Instead he should save himself money and trouble by buying a coating that will permit him to produce rapidly with his equipment a finish which will pass government inspection. He will find that the government is exacting about its requirements and it has a precise system of inspection.

"The government itself learned during World War II the lesson of poor economy of placing contracts solely on the basis of price. In the present emergency, it is entering into negotiated contracts more than ever before. It is taking into consideration, in addition to price, such factors as the producers' facilities, abilities, and technical skills and experience to do a particular job in the best way. Paint buyers will be wise to keep similar considerations in mind.

"It is far better for a contractor to have his finish supplier select or develop a specific coating on which he can rely to conform with the government specification involved and also function correctly and efficiently with his present finishing equipment and procedures, before rather than after he bids on a government contract.

"If he must meet a nearby deadline in bidding, and does not have the opportunity to investigate his defense finishing problem thoroughly, he should allow himself a reasonable factor of safety in the cost per gallon of finishing material he uses in estimating his finishing costs. He may find that while the coating for which he obtained a quotation conforms to the government specification, it will not function with his equipment without considerable and careful modification."

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WWP Finishing Section

# What makes the SPRAY GUN SPRAY?

...BY PAUL H. GRAHAM

CONSIDERABLE ATTENTION is directed these days to the study and application of better spraying techniques. Spray operators are being taught how to approach the work to be sprayed, how to line up the work, and how to lap the spraying strokes over the surface of the work, laying on a uniform coating of finish film thickness. Motion-study analysis determines the most efficient method of spraying any type of work, including the finer technique of triggering the gun to save material. Charts have been prepared to designate the proper air and fluid pressures for spraying the different finishing materials of varying degrees of solids on various types of work and work surfaces.

This is a most commendable activity. However, during the conduct of these comprehensive but customarily abbreviated and highly accelerated programs, the most important feature of all is too often passed over lightly or woefully neglected—the spray gun itself. Very few operators are taught how to hold the gun properly; what really makes the spray gun spray; how to choose the proper spray gun for a particular job or how to accurately regulate air and fluid pressures if those originally specified do not work out satisfactorily.

It has been stated that it is not necessary for the operator to fully understand the working parts of his spray gun. All he needs to do is to follow the recommendations of the spray equipment manufacturer. He does not have to know how to choose a particular spray gun for a particular spraying job because the manufacturer builds various types of spray guns designed to meet different requirements, and has made further allowance for variation by furnishing several combinations of air caps and fluid tips.

These statements might be accepted without further argument if it were not a fundamental trait of human nature to become curious and experiment. Since the operator will no doubt experiment with the spray gun, why not instruct

**Cut-away view of production spray gun showing operating parts.**

him properly so that he will know what he is doing? It is true that the spray equipment manufacturer can furnish the proper spray gun equipped with the proper air cap and fluid arrangement required to suit any particular material for the job at hand. But he seldom receives this information from the prospective spray gun user in detail sufficient to afford much more than an intelligent guess as to the equipment required. As for following the manufacturer's recommendation, how many operators can ever find the instruction sheet which came with the spraying equipment when it is requested? Very few, for it is usually thrown into the rubbish can along with the packing material.

### Selecting A Spray Gun

There is no single make of spray gun on the market today that will suit everyone! One reason for this is that no two pair of hands are the same and the gun feels differently to different operators. To test a spray gun, the operator should take it in his hand and hold it loosely to make sure it is not too heavy at the tip. If this nose is heavy, the restriction required to grip the gun will result in hand and arm fatigue, and probably poor work. When the gun is held in an easy natural position it should point toward the work to be sprayed. If it has to be tilted appreciably fatigue is bound to result. The trigger should be tested with the fingers for reaction to feel. That is, whether it feels easy on the fingers or bites into them. The trigger pull should be tested for free and easy action all the way back. Some triggers pull easy with the opening pull but become stiff when pulled all the way back. Selection should be according to the spray gun with the most uniform trigger action.

The spray gun should then be connected with the air and material supply lines. With the spreader adjustment set for a medium width fan pattern, a test panel should be sprayed at successive pressures of 20, 50, 60 and 80 lbs. When the results of all patterns are checked, if the higher pressures cause heavy ends and a light center, the nozzle combination will probably be delicate and touchy to adjust. The fan regulator should always be set for pattern at air pressure required for the material to be sprayed and a few tests should be made by the operator who is going to use the gun in production.

If you have noticed the manner in which most spray operators grip the spray gun, you probably saw them hold the gun as though it were a pistol, with the forefinger on the trigger—although a few might use either the index or middle finger. Hold the gun in this position yourself and you will soon discover that the gun just naturally tilts downward putting a strain on the wrist and forearm muscles when the gun is lifted to the proper position for spraying. Minimum strain is put on the wrist and arm, however, if the

index finger is placed directly out on the gun toward the nozzle, and the trigger is gripped with the middle and third fingers.

### How the Gun Operates

Before proper spray gun selection can be made, one must thoroughly understand the principle of its operation and the functions of its various operating parts. The spray gun is the mechanical center of the whole finishing system, and the quantity of production and the quality of the finish is primarily dependent upon its intelligent selection and operation. As one spray equipment manufacturer describes it: "The spray gun is a precision instrument into which both air and paint are introduced. Its function is to atomize or break up the paint into a spray pattern of uniform density for the best possible application of a finish coating."

Knowledge of just how the operating parts of the spray gun function to make this happen helps the operator to better understand his job and to remedy any trouble that might occur during the spraying operation.

Air pressure is provided to the gun from a compressed air supply line through a flexible air hose; paint or other finishing material is supplied by various means. It may be supplied by gravity feed from an elevated material container, by suction feed from a container attached to the spray gun, or by pressure feed from a pressure-feed container. The feed is made through a flexible fluid hose in the case of gravity or pressure feeds, or through an attached cup with coupled connection in the case of suction feed.

The ordinary spray gun consists of the gun body assembly, made up of a spreader adjustment valve, air valve, fluid needle adjustment, spray head

**Holding the spray gun properly puts minimum strain on the wrist and arm as shown by this operator who has placed his index finger out on the gun toward the nozzle and is gripping the trigger with his middle and third fingers.**

locking bolt, and the gun body which incorporates the trigger mechanism; and the spray head assembly consisting of an air cap, fluid tip, fluid needle, baffle, and the spray head barrel. The spray head assembly is usually arranged to be removed as one unit to permit one gun body to be used with several heads interchangeably; to allow quick change of materials; to permit it to be cleaned easily, and to allow quick replacement of a damaged head without the necessity of taking the gun out of service during repairs.

When the trigger is pulled back by the operator, after the gun has been connected up properly with air and material supply lines, the first pull swings open the air valve to direct air under pressure into the upper passages of the gun and through them out through the center orifice of the air cap.

**Standard spray gun consists of gun body assembly and removable spray head assembly.**

At the start of the spraying operation, the spreader or fan adjustment valve should be open. If it is, the air will also circulate through the upper air passages and out through the horn holes of the air cap.

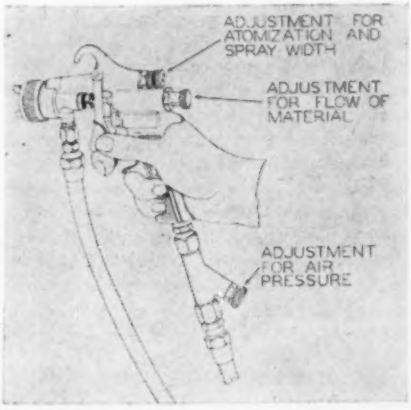
With the opening action of the trigger of the spray gun, air always flows on ahead of the fluid material and continues to follow it after the fluid feed is shut off. Thus a safety margin of air is provided both at the start and finish to make certain that all fluid material is atomized.

As the trigger is pulled farther back to a point beyond that where the air is released, the fluid needle is pulled back from its normal closed position in the fluid tip nozzle. This permits the material to flow out of the fluid tip and into the path of the center aid jet and the converging air jets of the air cap. The combined action of these air jets break up or atomize the fluid material into small particles to form a spray pattern and carries it in the form of spray onto the surface of the work being coated. This is the atomizing principle of spray finishing.

### Types of Spray Guns

All spray guns are either of the bleeder or non-bleeder type. The bleeder type gun is seldom used in production spraying operations but is more generally used where the compressed air system has no pressure controlling device. It is designed primarily to prevent air pressure from building up in the hose. Its name is derived from the fact that it is permitted to "bleed" air by intentional leakage from some part of the gun. Air is allowed to pass continually through the tip or nozzle, and the trigger controls the flow of the fluid material only.

The non-bleeder type spray gun is a production gun and is commonly used with controlled-pressure air and material supply systems. It is equipped with an air valve that shuts off when the trigger is released and the trigger controls both air and fluid material passing through the air cap and nozzle. A slight pull releases air into the upper gun passages and out through the air cap, and further retraction of the trigger pulls back the fluid needle to allow the fluid material to be released into the air stream.




**Spray gun adjustments to control flow of material, air and spray pattern.**

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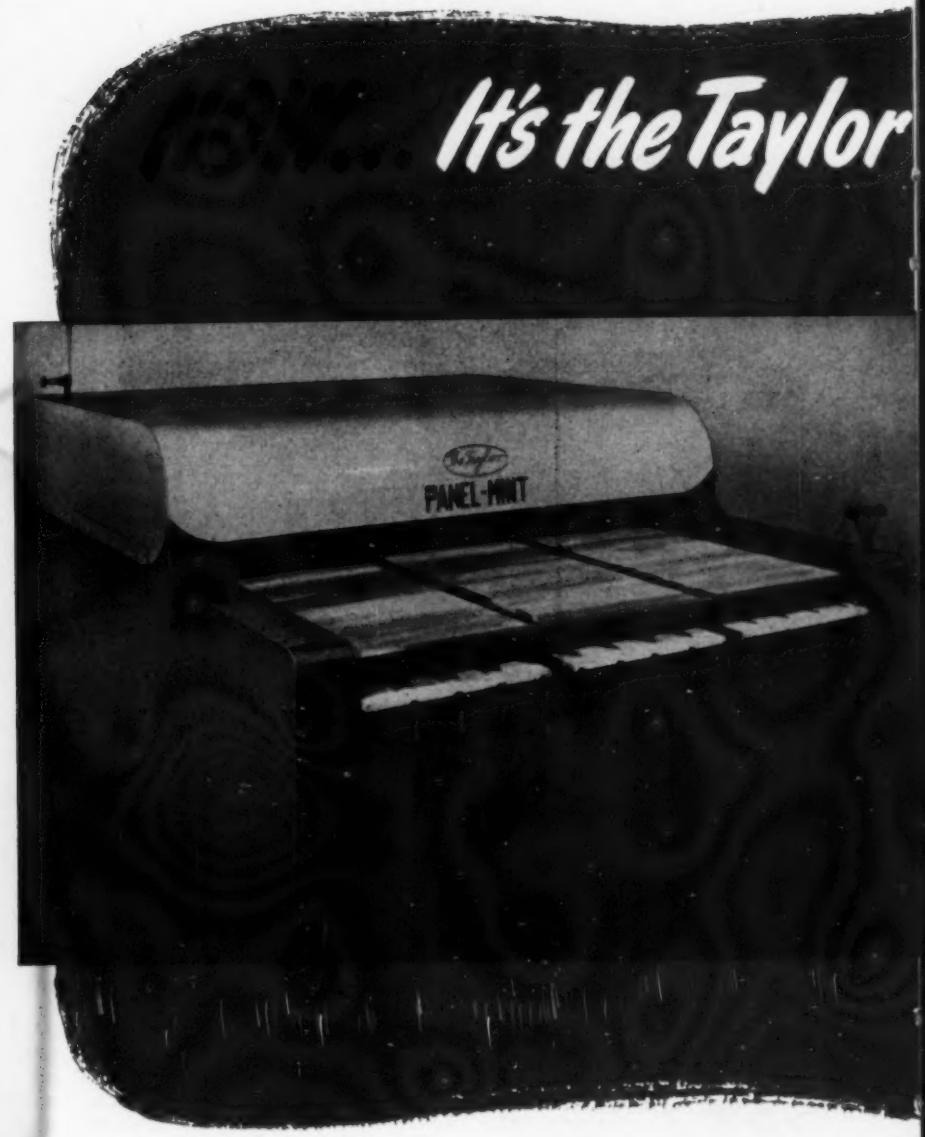
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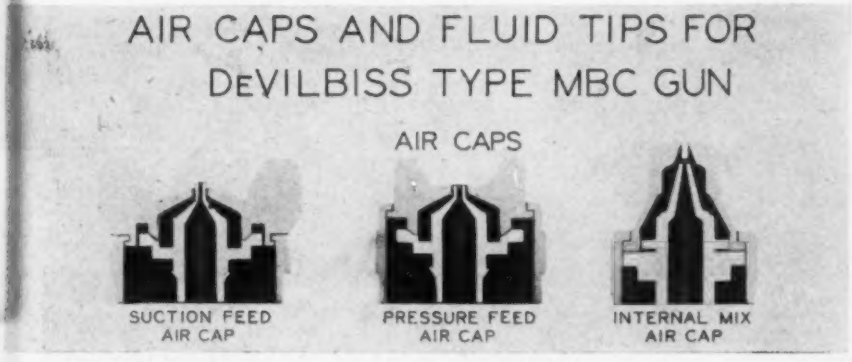
**Air caps: suction feed, suction or gravity feed and pressure feed.**

Two adjustments are common to all spray guns, the fluid needle adjusting screw and the spreader or fan adjustment valve. The purpose of the fluid needle adjustment is to limit the distance the needle may be withdrawn from its closed position in the fluid tip to control the flow of material through the fluid tip.

The purpose of the spreader or fan adjustment is to control the width of the spray by manipulation of the valve. More air is permitted to flow out of the horn holes of the air cap to hit the round center stream of air and fluid material as the valve is screwed out to flatten the spray pattern into a fan shape. The spreader adjustment valve is usually equipped with a graduated dial which records the adjustment. As these graduated adjustments are noted for future reference, they permit an easy and quick return to the setting required for any desired spray pattern.

Other spray gun types are further classified according to feed and mixing action of the air caps. The air cap is the working end of the spray gun and with its working partner the fluid tip, located close behind it, controls the ratio of air to fluid material required to perform the spraying operation. This delicate balance may also be further refined and controlled by other adjustments on the gun at the air and material supply pressure sources.

Spray guns are also classified according to the type of material feed employed into either suction or pressure feed types. The suction feed type is also used in gravity feed spraying,




**Air caps: suction feed, pressure feed and internal mix.**

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**ABOVE** diagrams show how a knife is moved forward to take up for wear, yet without change of cutting angle. **LEFT** diagram shows positive, safe grip of knife by the holder.

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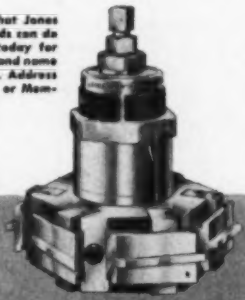
**Find out NOW what Jones & Orth cutter heads can do for YOU! Write today for our latest catalog and name of nearest dealer. Address either our Seattle or Memphis branch!**



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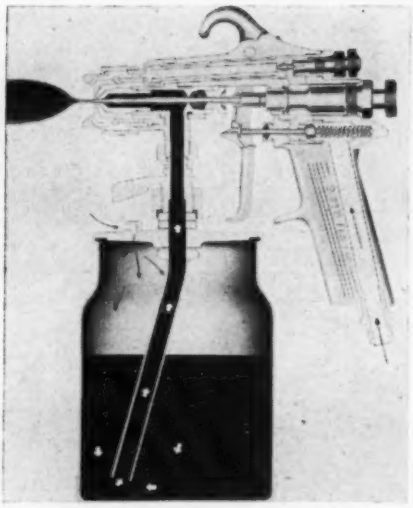
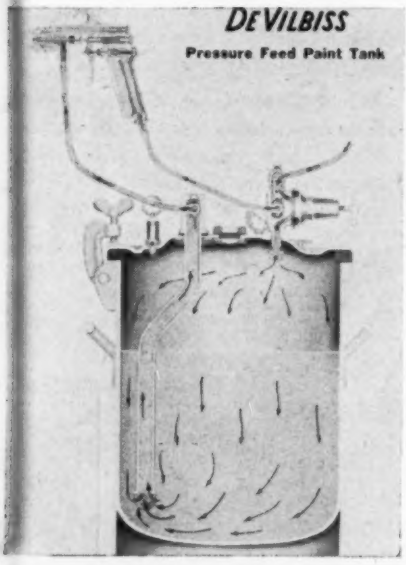
where the fluid material is fed to the spray gun from an overhead material container.

In the suction feed type of spray gun, which operates on the vacuum principle, the fluid tip is set to project beyond the air cap opening so that a vacuum is created by air under pressure passing the fluid tip which draws the fluid material to the orifice of the tip for atomization. This atomizing takes place outside of the air cap in an external mixing action. This type of spray gun is not generally used for production spraying.

In the pressure feed type, which operates with a presure-feed material container in which the fluid material is under pressure and in which pressure forces the material out into the fluid tip of the spray gun, the air cap must be capable of providing a large volume of air to atomize a large volume of liquid. The fluid tip is set nearly flush with the air cap opening. A greater volume of air is usually required than with the suction feed type gun, but this type of spray gun can operate at relatively low pressures. This is the kind of spray gun generally used in most modern production spraying operations.



**Suction feed type gun operates on the vacuum principle with external mix air cap.**

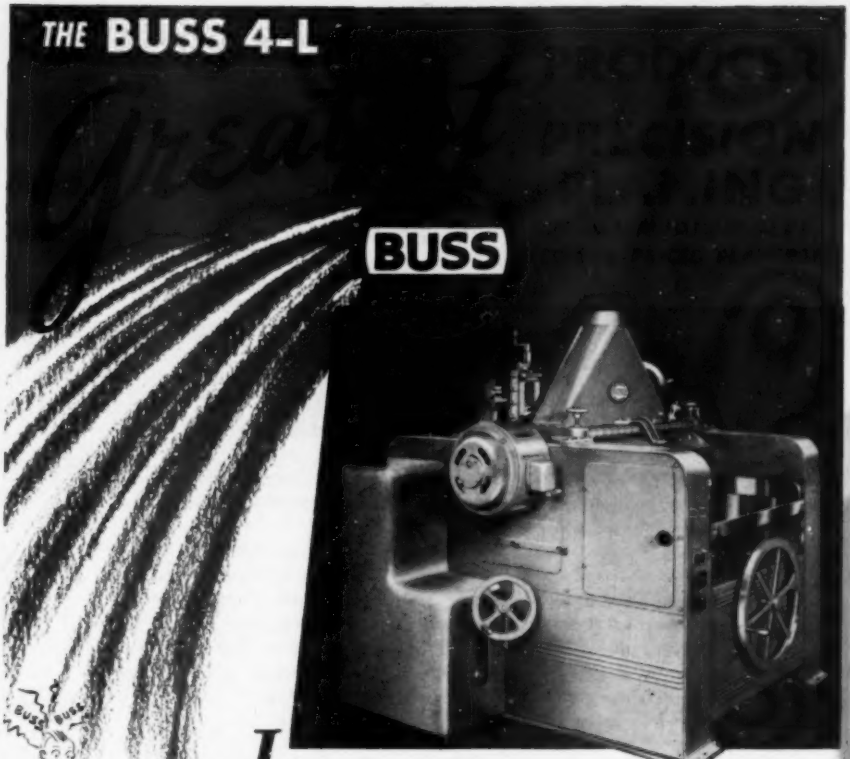



**Spray gun operation with pressure feed material tank.**

All air caps are classified according to their mixing action into either external mix or internal mix types. The external mix air cap is used with either suction or pressure feed, mixing air and material outside the air cap. In its conventional-type cap air is ejected through three orifices: center and two spreader horns. Multiple jet caps are also provided with five, seven or nine orifices: center, two spreader horns, plus twin jets and auxiliary jets.

The external mix air cap is best suited for spraying the heavier-bodied finishing materials, particularly where the multiple jet air cap is used. Heavy viscous materials, such as high solids

# THE BUSS 4-L



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**Pressure bar, lower rolls or upper outfeed rolls may be cocked; or uneven tension on latter. BUSS instantaneous micro-controls practically eliminate this trouble. Write for further details.**

IN NO other planer in the medium-size, lower-price range can you get INSTANTANEOUS CONTROL OF LOWER ROLLS, INSTANTANEOUS MICROMETER CONTROL OF PRESSURE BAR, the SHEARING BAR, VARIABLE SPEED and the many other BUSS exclusive features that save time in set-up and changeover, provide maximum production and finest quality finish planing. If your production requirements are within the capacity of the 4-L (24″, 26″ or 30″ x 8″) a simple comparison will quickly convince you it is the finest, most advantageous planer you could possibly buy. Write for Bulletin 54 for complete details.

The BUSS line contains a type and size for every production set-up. Singles: — Small, Medium and Large; Double Surfacers and the No. 55 for surfacing rough lumber. Write for bulletins or consultation on any planing problems.

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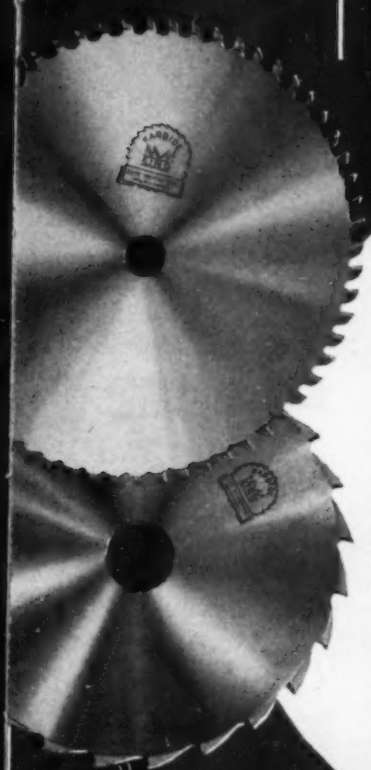
lacquers, synthetic and varnishes, are atomized best by the higher pressures provided and since the material is atomized outside the cap, there is little tendency to clog the fluid nozzle. This feature also makes the external mix air cap preferred for spraying quick-drying materials. The multiple jet external mix cap also provides a more uniform spray pattern because of the better control and equalization of air volume and pressure from the cap.

This article on spray guns and spraying technique will appear in three parts. Part II is to be published in June.

A company's behavior must be as good as its literature claims. As one expert warns, "It is of little avail to have the factory walls decorated with portraits of Abraham Lincoln if Ivan the Terrible is walking up and down the aisles."

—**Franklin P. Adams.**

# Don't send a Boy



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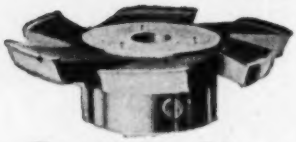
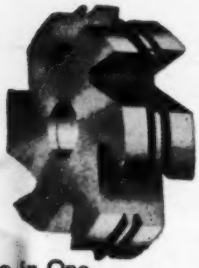


Champion Cope Cutters

Rosette Cutters

Carving Machine Cutters



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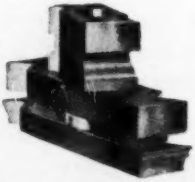
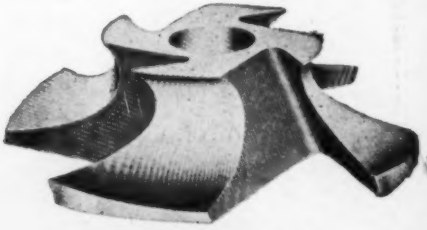


Sash Cutters



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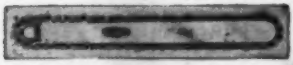

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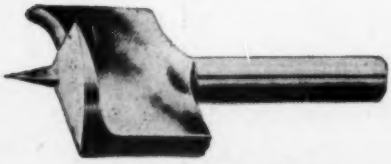

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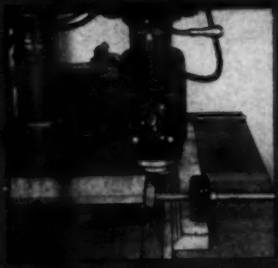

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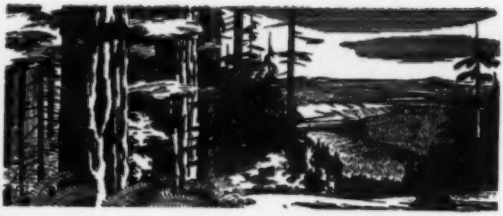

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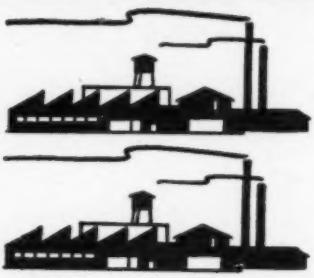

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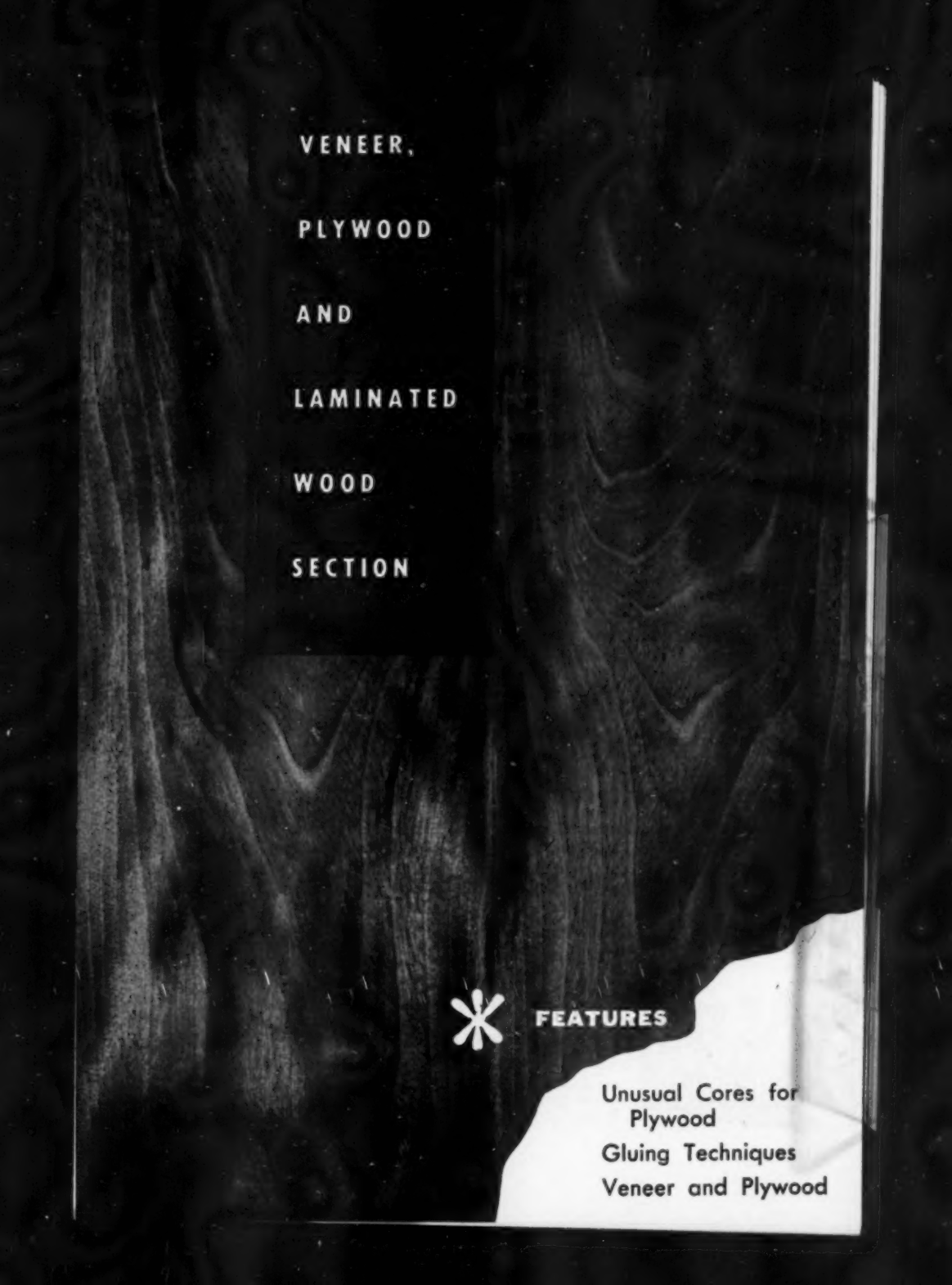

**FEATURES**

Unusual Cores for Plywood
Gluing Techniques
Veneer and Plywood

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**Good 2 Sides**

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BY THOMAS A. DICKINSON

# UNUSUAL CORES FOR PLYWOOD

WOOD-CORE materials for plywood or wood laminates are normally advantageous in terms of low cost, physical properties, and fabricational characteristics; but, due to the current imminence of another devastating war, it is becoming increasingly important for manufacturers in all industries to contemplate alternate materials and production methods—not only to soften the blow of greatly increased taxes, but to alleviate the effects of possible material shortages and to accelerate the national defense effort.

Therefore, a number of western wood products companies have recently found it expedient to determine the possibility of using new-type materials (such as paper, fabrics, and plaster) as lamination cores. Each of these materials has certain advantages and disadvantages, particularly from the production point of view; yet their use in many future circumstances may be essential because:

(1) They are available without priorities—frequently as low-cost scraps (for example, in the form of used paper and fabric materials).

(2) They are compatible with most of the adhesives now used in the manufacture of plywood, and do not necessarily require a great sacrifice in the quality of a finished product.

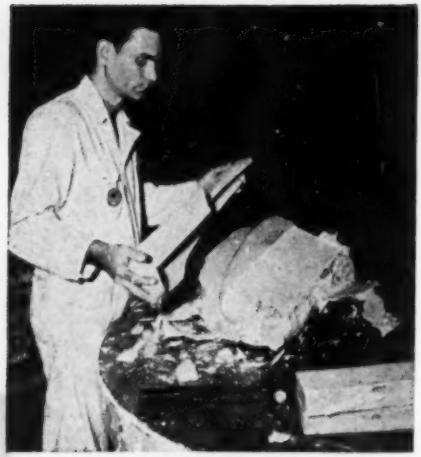
(3) They will permit the use of certain types of wood-core materials as facing veneers, where it is practical to use special graining and coating techniques for desirable surface properties and finish effects.

Paper is in many respects the best alternate core material because it is fundamentally a wood product and available in many forms at low prices. However, many grades of paper cannot be handled as easily as conventional wood veneers and must be resin-impregnated if the finished product is to have maximum resistance to water, high mechanical strength, etc.

Reclaimed fabrics cost more than salvaged paper products and must also be impregnated for optimum bond strength. Yet fabric cores may have better physical properties in terms of cross-sectional thickness than cores of standard plywood.

Plastic sheets or films (such as cellophane), leather findings, and related materials are comparatively expensive and sometimes quite difficult to adhere to wood facing materials; but they have been available in substantial quantities when other materials could not be obtained, frequently require no impregnation, and normally have more inherent strength than other potentially-useful core materials.

Compounds such as plaster of Paris can frequently be obtained at low prices for the casting of cores in simple molds or forms without great difficulty; further, they permit the production of



**Plaster cores for wood-faced laminates can be cast over fibre reinforcements for many different shapes and dimensions.**

laminates with excellent sound and thermal insulation properties (for wall panels, etc.). However, wood and plaster surfaces cannot be adhered as readily as other laminae; and most cast-plaster materials, without integral reinforcements, have little mechanical strength.

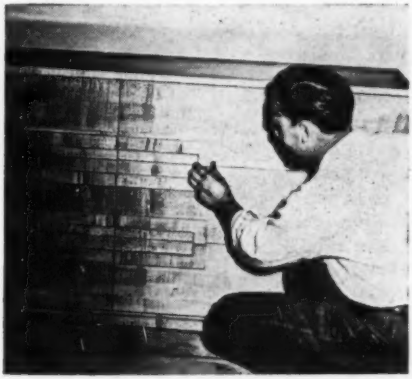
Methods of laminating wood facing materials to the aforementioned cores are fundamentally the same as standard plywood-fabrication techniques — involving the use of adhesives and equipment, pressures and temperatures, which are adaptable to production requirements in individual plants. However, a number of detailed procedural variations must be evolved for the sake of efficiency in a majority of circumstances.

For example, in the use of paper-core materials for the fabrication of comparatively large panels, engineers for Atlas Products Company were recently obliged to work out a special method of mating the edges of individual core laminae so that the resultant joints would become neither deformities nor weak spots in the panel cores. This consisted of using a heat-fusible cellulose tape to assemble each lamina as a series of end-to-end sheets, prior to coating the paper with a thermoplastic adhesive, so that the subsequent laminating temperatures and pressures would cause the tape to be uniformly flattened and distributed over each core joint.

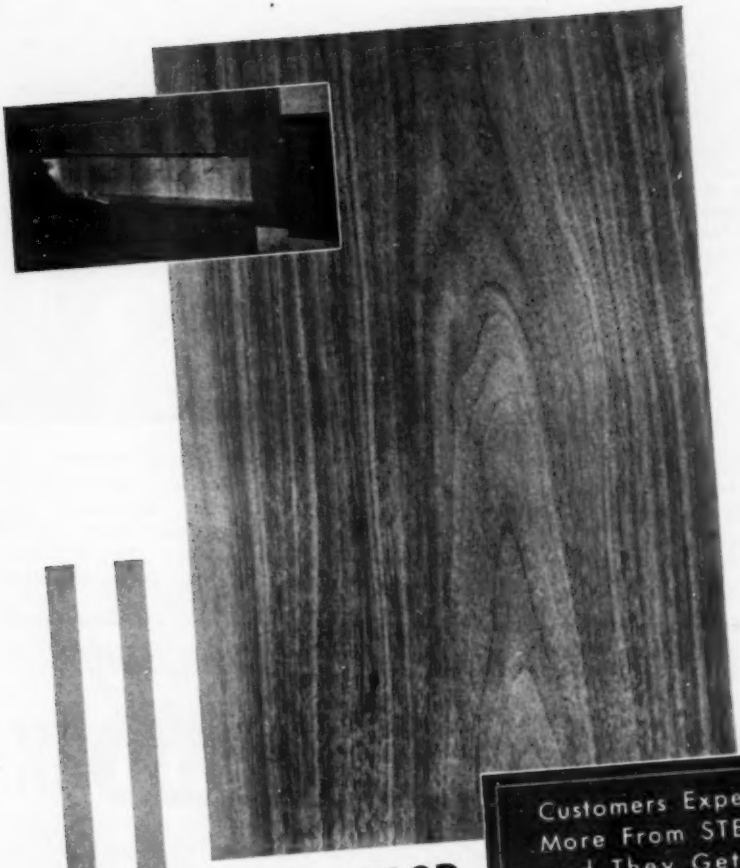
Incidentally, thickness is an important consideration in the use of paper products as core materials—although the thinnest grade of tissue may be as useful as the heaviest grade of cardboard—due to the following factors:

(1) Thin grades of paper tend to absorb liquid adhesives with considerable speed, and cannot be readily handled as individual laminae in the wetted condition. Accordingly, the laminae must respectively be coated as they are stacked (if thermosetting adhesives are used) or allowed disturbance before they are stacked (if thermoplastic adhesives are used).

(2) Heavy grades of cardboard or paper can be handled in the wetted condition, but may require considerable soaking time for adhesive impregnation—particularly where "coated stock" is used.



**Furniture comprising non-wood cores and veneer facing materials may have the appearance and many of the properties of the finest hardwood furniture.**



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**Some efficiency may be lost when dielectric heating equipment is used to adhere laminae comprising different materials, but this is not normally a critical factor.**

Virtually all liquid adhesives can be used to coat or impregnate paper core materials—including the low-cost, solvent-dispersed thermoplasts. For example, Sechrist Plywood Company is currently manufacturing strong (yet extremely inexpensive) furniture components by using schellac as an adhesive coating for wood and paper laminae so that the latter can be molded and adhered after drying by heat-fusion at low pressures with a


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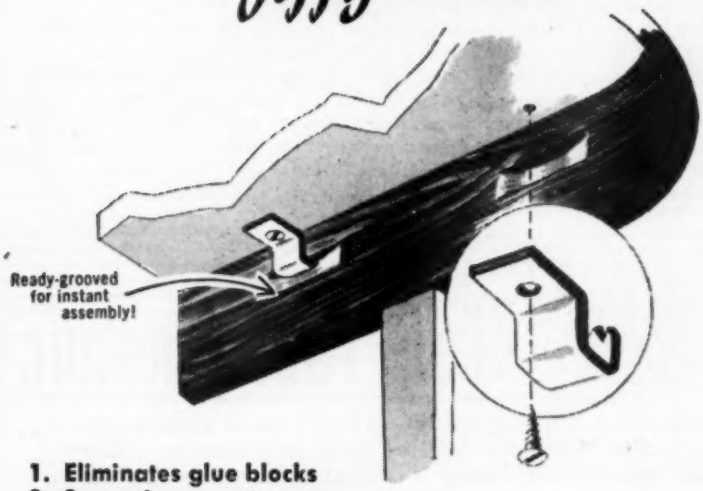


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simple pneumatic compression press.

Glass fibers or fabrics are probably the toughest and most durable of all available laminae materials, but have been limited by high costs in the manufacture of wood products to a few special applications—for example, as integral edge reinforcements to prevent the cracking or crumbling of plaster cores and as supplementary laminae in paper cores where the latter required considerable resistance to tear-out stresses for unusual assembly purposes.

Cotton and other inexpensive fabrics or fibers are as good as glass materials for most purposes, and are especially useful as cores for facing veneers when laminates of extreme thinness must be fabricated because they minimize the tendencies of the veneers to split or crack in the presence of flexural forces. Most thermoplastic and thermosetting adhesives can be used to coat or impregnate fibrous materials for lamination purposes, but the thermosetting-polyester elastomers are the best bonding mediums for maximum flexural strength in thin wood-faced laminates.

For example, tests recently conducted by Douglas Aircraft Company indicates that a single layer of coarse cotton fabric impregnated with a Vibrin resin (made by Naugatuck Chemical Division of U. S. Rubber Co.) can be sandwiched between two hardwood facing veneers to produce a laminate which is strong and flexible enough to be used in place of aluminum alloy sheet stock as the "skin" for a modern airplane.

Plastic sheet or film core materials often require no special adhesives for lamination purposes, since they can be heat-fused or solvent-softened (with methyl ethyl ketone, acetone, alcohol, or a similar solution) for the adhesion of facing materials. For instance, Atkinson Company of San Francisco has reportedly fabricated panels for indirect-


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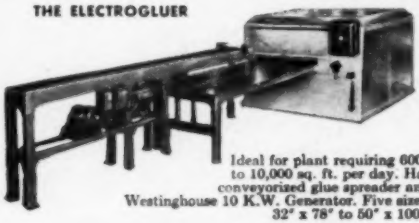

Ideal for plant requiring 6000 to 10,000 sq. ft. per day. Has conveyorized glue spreader and Westinghouse 10 K.W. Generator. Five sizes, 32" x 78" to 50" x 100".

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Now you can have top quality along with high speed, low cost production of glued-up panels, chair seats, table tops, door stiles and rails, and other similar items. And, no matter what your requirements may be, there's a Plycor machine to give you exactly the production you want.

The outstanding worth of Plycor edge-gluing equipment is demonstrated daily in hundreds of the country's leading furniture and woodworking plants. And in every instance it has established an enviable record for quality and economy.

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lighting purposes by using chloroform to "tackify" the surfaces of 2"-thick Plexiglas plates (which are capable of "piping" light) so that the acrylic materials could be adhered to opaque facing veneers by applying static pressure and allowing the chloroform softener to evaporate.

Scraps such as "leather dust" (caused by buffing or sueding leather surfaces) are obtainable from shoe manufacturers, bookbinders, etc., and have been used like sawdust as inexpensive fillers in liquid plastics for the casting of many special types of cores for wood facing materials.

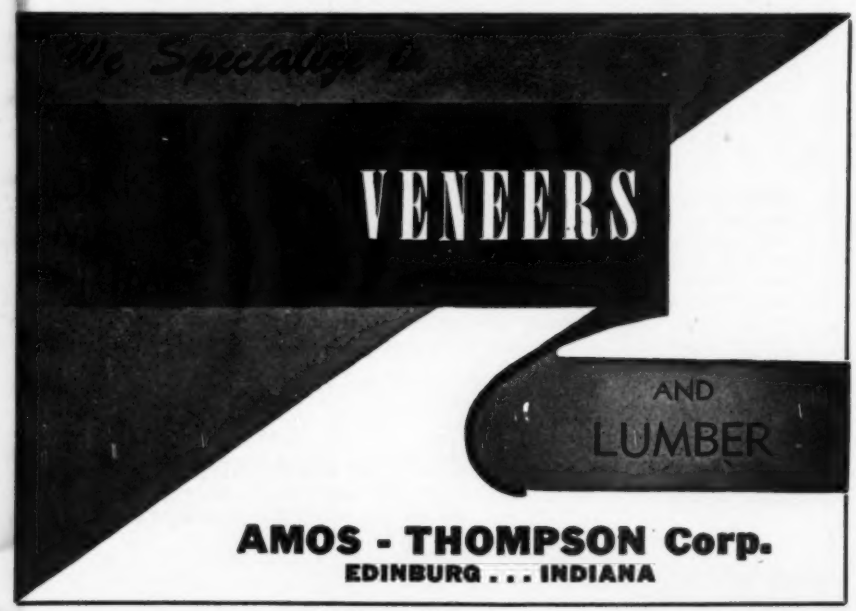
A number of high-strength plasters, such as U. S. Gypsum Company's "Hydrocal," can be used without reinforcements to cast cores for wood laminae; but, where cost is an essential consideration, less-expensive types of plaster (with reinforcements, as previously suggested, if necessary) are preferable.

Many plaster casting mixtures will adhere strongly to wood facing elements as they solidify; but better bonds can sometimes be produced if plaster cores are separately cast in lubricated forms, surface-sealed with several coatings of lacquer or shellac, and laminated with standard adhesives such as the Weldwood phenolic.

Conventional plaster casts can also be impregnated with resinous compositions (such as the furan resins produced by Furane Plastics & Chemical Co., Glendale, Calif.) so that they can be laminated as cores with superior strength and durability. However, impregnation may greatly increase the cost of a plaster cast.

Where dielectric heating equipment is used to adhere combinations of wood and other lamination materials, a certain loss of heating efficiency can be anticipated due to differences in the resonance properties of the materials.

**The End**

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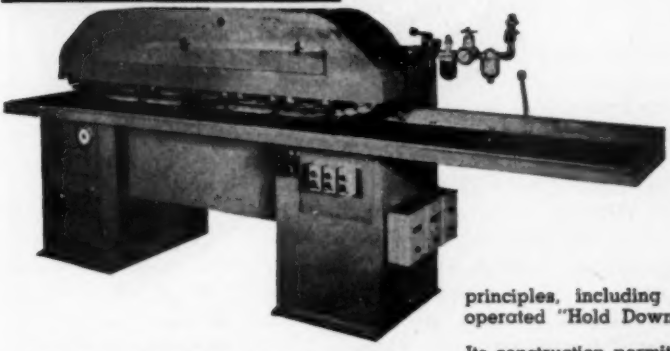

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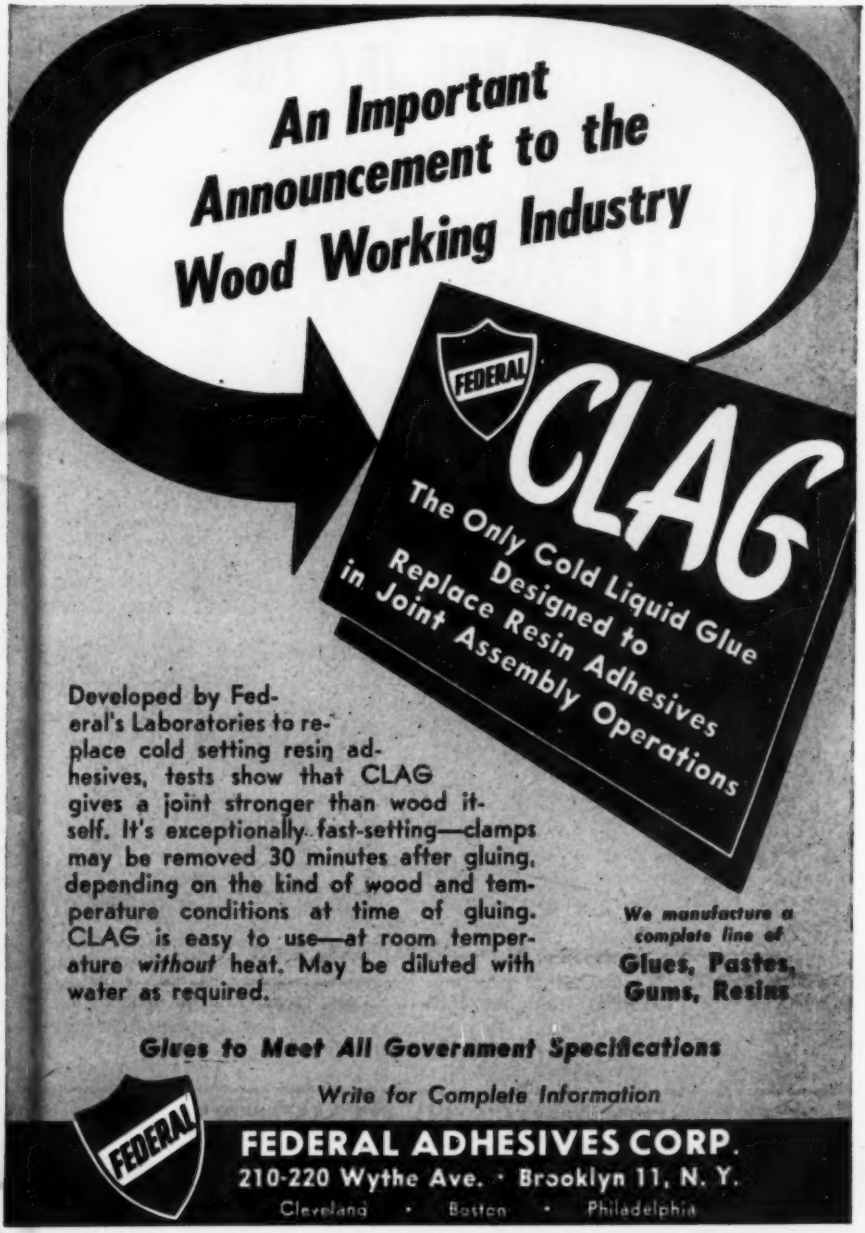
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# GLUING
## *Technique for wood*

### SIMPLE AND COMPOUND CURVES IN PLYWOOD

BY THOMAS D. PERRY

The previous article, on the proper preparation of veneers and lumber cores for flat and formed plywood, gave specific data as to (1) the thickness of the glue lines; (2) the importance of uniform thickness in each veneer or lumber layer; (3) the most favorable moisture content; and (4) the essential requirement of air conditioned storage rooms for the veneer and lumber cores after preparation and until gluing. It also outlined these features in their relation to the principal glues and adhesives that are in current use. Nearly all of these data apply with equal force to the curved plywood described in this article, and need not be repeated, except in cases where modifications are needed.

THESE METHODS of making curved plywood are those in which the shaping is done before the glue has hardened. They are divided into four principal types, viz.:

Simple curvature with lumber cores, pressure in one direction.

Simple curvature in all-veneer constructions, pressure in one direction.

Simple curvature in all-veneer constructions, pressure in two or more directions.

Compound curvature with flexible or fluid pressure, omni-directional pressure.

There are other methods quite different in character, by which flat plywood can be made into simple curvature by heating or recessing the concave sides, but space precludes more than mention of these. In some instances there may be an option of more than one method, and combinations of methods are sometimes found useful.

**Pressure Distribution**

Most types of plywood presses exert pressure in one direction only, and, in flat plywood, the only question in the equal distribution of this pressure over the entire area, is the stiffness of the distributing plates or head blocks at the screw or piston. In the case of curved plywood, the direct pressure decreases as the curvature increases. This can be illustrated in Fig. 1, where the geometric chart indicates full vertical pressure at "A," about ¾ pressure at "B" and only ½ pressure at "C." Putting this principle into practice, as in the pair of curved forms, Fig. 2, indicates that it will be possible to obtain ¾ of the normal vertical pressure over one quarter of a cylindrical form. If these forms are well fitted and proper allowance is made for the thickness of the plywood, strong plywood joints can be made. The radius of the upper form must be less than the radius of the lower form by exactly the thickness

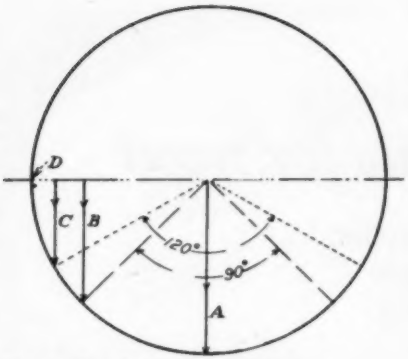


**Fig. 1. Graphic pressure diagram.**

of the plywood. If this is not true, the pressure will be uncertain, and the glue joint will be defective. This thickness allowance is an essential and fundamental factor in the gluing of any curved plywood with pressure in a single direction. The pressure, beyond the 90° angle in Figs. 1 and 2, with accurately made forms, may be reasonably satisfactory up to nearly 120°, but beyond that it is wholly unreliable.

### Simple Curvature with Lumber Cores

Pressure in One Direction

There are many constructions in furniture where regular or irregular convex curves are required for drawer fronts or cupboard doors, and also concave curves for recessed areas. It is usually desirable to make them with lumber cores, of substantially the same thickness and construction as the tops and end panels. These cores can be band sawn from glued laminated blocks as is indicated in Fig. 3. It should be noted, that when such blocks are laid up as shown, from plain sawn lumber, that the curved cores themselves will be quarter sawn, and hence have less warping tendency than plain sawn flat lumber cores. In the case of the left sketch, all saw cuts are made from a single template, with the same degree of curvature. This results in cores that are thicker at the center than at the ends. In many constructions this is not objectionable, and it is economical in utilizing the entire block without waste, except for the end segments. On the other hand if cores must be of equal thickness throughout, it is necessary to use a double template, making allowances for the different radii. This is shown in the right sketch, where the solid black crescent shaped pieces are kept in sequence and used in clamping. These crescents, otherwise, are waste, and may amount to 40% or 50% of the block.

Theoretically the width of the saw kerf should be equal to the thickness of the face and crossband veneers that fill this space as they are glued to the cores, but in actual practice, with poplar lumber cores, the kerf is about 3/32" to ⅛". The band saw blades must be kept sharp and taut to produce clean smooth cuts.

The same procedure is used for so-called serpentine drawer fronts, or other types of curves, limited in all cases by the effective pressure diagram as indicated in Fig. 1.

### Simple Curvature in All-Veneer Constructions

Pressure in One Direction

In all-veneer constructions it is possible to make a variety of types of curved plywood from flat veneers, between pairs of rigid curved dies, as are

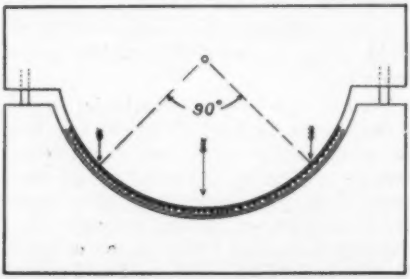


**Fig. 2. Clamp for a cylindrical section.**

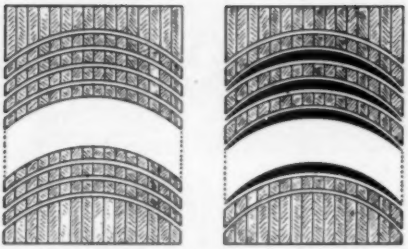

**Fig. 3. Curved lumber cores, sawn from laminated blocks.**

sketched in Fig. 4. These dies are hardwood (usually maple), glued and bolted together to withstand rough usage. The curved faces of these forms must be equidistant at all points, and when made from ¾" plywood cannot be used for any other thickness. This is an important feature that is often overlooked and inevitably results in poor gluing. Only one piece of plywood can be glued at a time, and the pressure must be applied while the glue is still tacky.

Types of curved plywood made in such forms are shown in Fig. 5. It is to be noted, that, in such plywood, two thicknesses of ⅛" veneer are preferable to one of ¼", for easier bending, and that veneers bent across the grain must be as thin as practicable. These thickness relations in the sketch are typical, but may vary in different constructions. A considerable number of sets of such dies are required, but as they are simple and easily made of 8/4 maple, most woodworking factories can make their own.

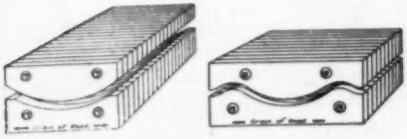

**Fig. 4. Pairs of hardwood dies for curved plywood.**

Quick setting glue mixtures are required and are available for two hour clamping cycles, permitting about five units per eight-hour shift per set of forms. Lining these forms with rubber or metal blankets, in which resistance heat units are incorporated, will shorten the operating cycles when resin adhesives are used.

Where larger production quantities are involved and a reasonable tolerance can be allowed in the curve, metal

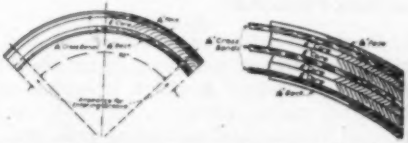

**Fig. 5. Types of curved plywood, after edges are trimmed.**

forms can be used, making approximately a dozen curved panels per pressing, as indicated in Fig. 6. This process is used for seating backs and has given excellent results. The radius of the convex form is less than that of the concave form by the aggregate thickness of the plywood charge, usually about 4", accommodating three to six backs per press opening. This procedure requires r o o m temperature glues or adhesives.

### Simple Curvature in All-Veneer Constructions

Pressure in Two or More Directions

The limits indicated in Figs. 1 and 2, for single directional pressure, logically lead to the need of pressure in additional directions, where more than a quadrant of a circle, or its equivalent, is involved. Such curved members are often laminated with parallel wood grain in the adjacent layers, rather than the alternate grain direction of conventional plywood.

An example is a laminated skirt or apron to support the edges of round dining table tops, as indicated in Fig.

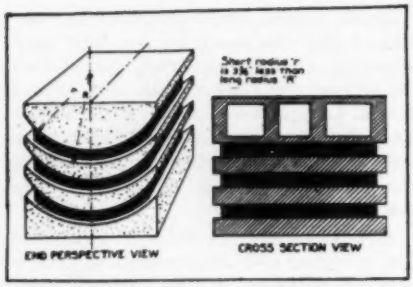


**Fig. 6. Metal dies for multiple pressing of curved plywood.**

7. In this illustration, the jaws of the bending machine are removed for clarity. This bending machine provides a type of radial pressure, as well as normal vertical and horizontal pressure, and thus complies with the diagram of pressure shown in Fig. 1. It is customary to lock the clamp bar, "D", in place, to prevent its slipping off.

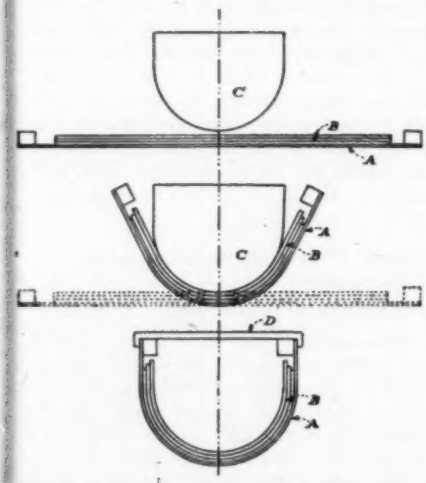


**Fig. 7. Curved skirts for round table tops. A—stiff brass band, serving as outer form; B—veneer layers with parallel grain; C—wooden block, serving as inner form; D—clamp bar for maintaining pressure after removal from bending machine.**

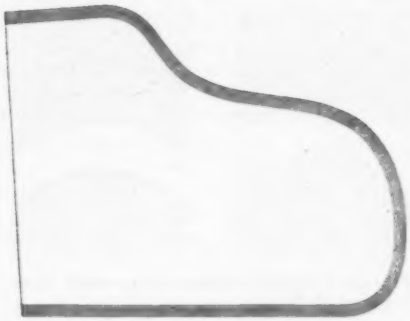

**Fig. 8. Laminated rim for grand pianos.**

Another example of this type of curved gluing is the grand piano rim shown in Fig. 8. In this case a rigid form is provided, which has flanges for the inner end of the screw clamps. This inner form is faced with a wide metal strip and a similar metal strip is placed on the outer side of the veneer assembly. Properly curved pressure distribution blocks go against this outer plate directly under the outer end of the screw clamps. This laminated rim must remain under pressure for a matter of hours, and a clamp bar is nailed across the open end of the rim. With standard room temperature glues, it is necessary to season this rim, after removal from the form, for approximately one month. There is always a chance that the contour of the rim will change somewhat during this seasoning period, due to the "working" of the wood and glue during drying.

A more recent development that

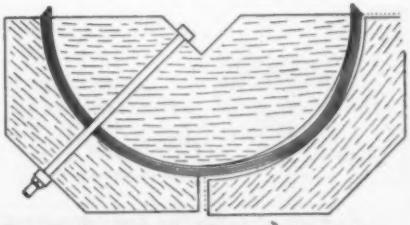

**Fig. 9. Segmental clamps, of wood.**

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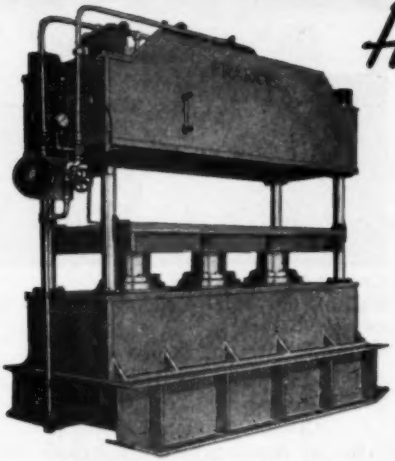

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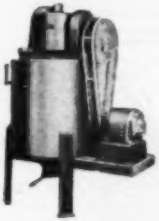

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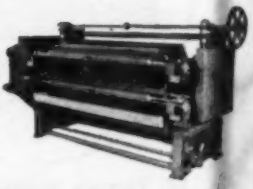

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eliminates the hazard of this "working," is to use electronic heat to thoroughly cure the resin adhesive, while still under pressure. The two metal strips are used as electrodes for the high frequency current, and the rim is practically dry when removed from the clamp. Under this procedure the clamp bars are used as before, but the final seasoning (and cooling) period can be reduced to a few days, and the losses from deformation during seasoning are negligible.

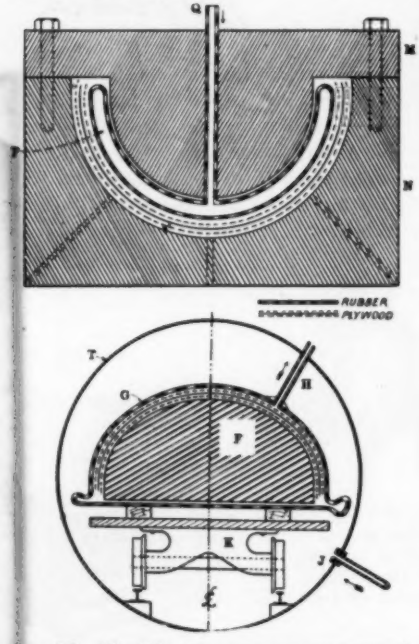


**Fig. 10. Flexible pressure on compound curved plywood. Upper: inflatable rubber bag. Lower: deflatable rubber bag, supplemented by pressure in sealed autoclave.**

Still a third technique is shown in Fig. 9, where segmental clamps are used, which are easily made in any woodworking shop. This may be useful and economic for various types of curves when substantial production quantities are not involved.

Courtesy U. S. Plywood Corp.

**Fig. 11. Lay-up of plywood boat hull for autoclave work.**

**Compound Curvature with Flexible, or Fluid, Pressure**

Omni-Directional Pressure

So far direct pressure has been considered, in one or several directions, and all curvature has been simple. They might be called cylindrical shapes as contrasted with spherical shapes. Hence the plywood or laminated construction could be made from full width strips or complete sheets of veneer.

This is in marked contrast to compound curvature, where the strips of veneer must be narrow to permit the

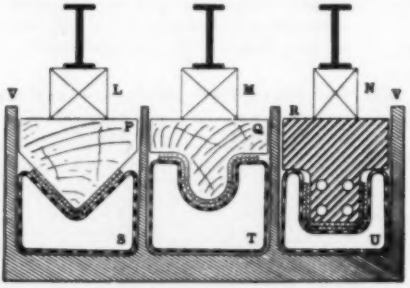

**Fig. 12. Tubular pressure for plywood chips.**

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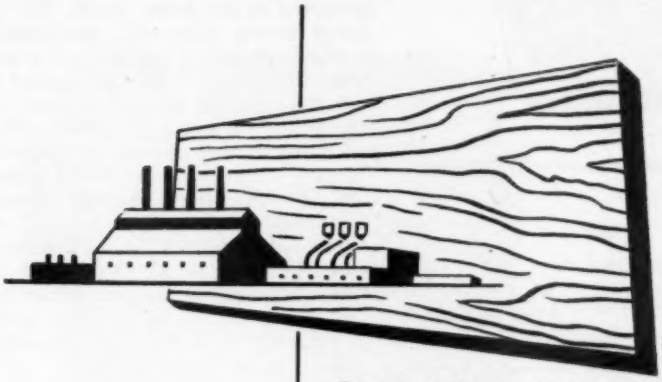

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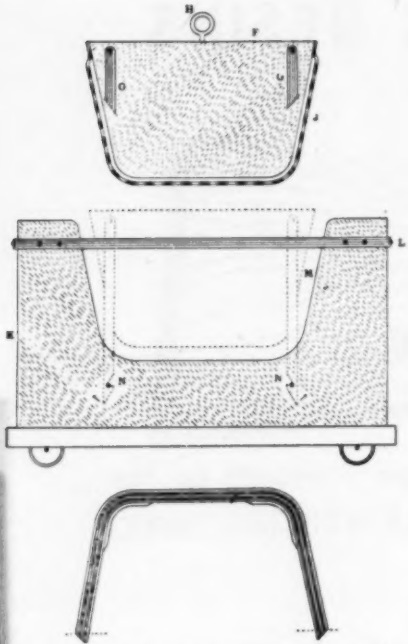

**Fig. 13. Simple curvature for bent plywood chair legs.**

necessary twisting, and are often tapering to prevent overlapping at the edges. An example can be cited in the segments of an orange peel, which make up a sphere. If the strips are narrow enough and properly tapered, flat veneer can be curved and bent into such spherical shapes, as there is always a reasonable amount of "give and take" in wood.

This technique was developed during the years of World War II, to provide plywood of monocoque shapes for airplane fuselages, wings, nacelles and the like, as well as for the hulls of small boats. It consists of applying pressure by means of inflating or deflating a flexible rubber bag, which exerts omnidirectional pressure on the plywood against a rigid die or form. Examples are shown in Fig. 10, in which the upper sketch indicates a rubber bag, "P", which can be quickly inflated. The heat for curing the resin adhesive is provided in the lower mold, "N." The lower sketch illustrates the autoclave method applied to the hull of a small boat. The strips of adhesive coated veneer are lightly tacked on the male mold, "F," of wood; the mold and veneer lay up are inserted in the rubber bag, "G"; the air is exhausted through "H"; the completed enclosed assembly is pushed into an autoclave, "T," continuing the vacuum; and the pressure, usually steam, admitted through "J." The operating cycles are rather long, two hours and up, so that the process is economic only on large and complicated shapes.

The veneer strips are precoated with a phenolic resin, and dried down to 5% m.c., to prevent the development of steam pockets in the plywood assembly. The strips are then laid over the mold, crossing the alternate layers as shown in Fig. 11. Small staples are driven through each layer into the wooden mold, to hold the strips in the proper location until the necessary pressure and heat cures the resin adhesive.

Tubular pressure, developed by inflating a rubber hose with hot water or steam, is a variant in flexible bag molding, and the process is shown in Fig. 12. These plywood clips, in long

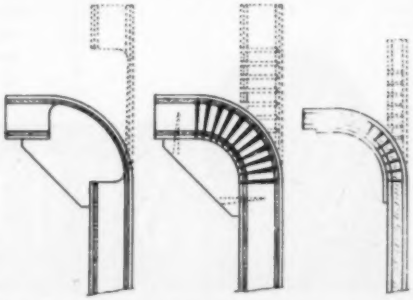

**Fig. 14. Curving flat plywood by recesses in the concave side.**

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**Fig. 15. Molded plywood chair.**

strips, were extensively used to reinforce joints in plywood aircraft constructions.

Flexible pressure, by means of a rubber blanket, sealed to one of the forms, is also used for simple curvature, as is illustrated in Fig. 13. These forms are of wood, the lower form providing the shape of the mold, while the upper form is supplemented by an inflatable cushion. Resistance heating strips are bedded in the rubber blanket, to cure the resin adhesives. It can be observed that reinforcing strips are provided to strengthen the sharp bend, and that the rubber blanket accommodates itself to such irregularities in plywood thickness.

Mention was made, earlier, of methods by which flat plywood can be bent into simple curvature, and several of these procedures are shown in Fig. 14. There are a number of other ways to produce curves in flat plywood.

## Conclusions

While the writer has observed many methods of making plywood curves, there are some results that are beyond his ability to diagnose. An example is the curved plywood chair shown in Fig. 15, evidently cut and bent from a

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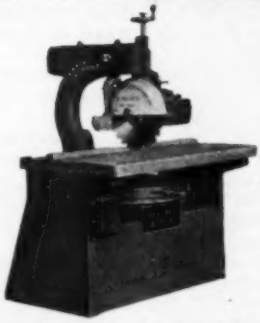

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### 20" HEAVY-DUTY BAND SAW
**MODEL 72-B**

Has every modern feature for precision heavy-duty production. Fully guarded ball-bearing wheels, ball-bearing roller guides, positive saw aligning and tensioning device. Direct or V-belt drive.

### 16"-18" TILTING ARBOR SAW BENCH
**MODEL X24-B**

Accurate and dependable for heavy production. All adjustments, convenient, easy-to-operate and safe. Capacity to 4½". Table 36" x 40". Saw tilts to 45°. 5-7½ H.P. Motors.

### 20" PLANER
**NO 41.**

Outstanding, low priced, general purpose planer. Turns out large volume of quality work at low production cost. Capacity 20" x 6". Two speeds: 24 and 36 FPM. 4-knife safety cutter head.

### 8" BALL-BEARING JOINTER
**MODEL X-13**

Precision machine for quality work. 3-knife safety head. Steel table lips, guarded front and back. 60" table. Heavy cast-iron floor stand. Tilting fence. Direct drive motor.

Send for literature giving complete details on Monarch Profitable-Production machines.

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**AMERICAN SAW MILL MACHINERY CO.**

*Quality Woodworking Machines Since 1903*

**204 MAIN STREET, HACKETTSTOWN, N. J.**

solid sheet of plywood some ¾" thick. No record has been found as to how it was made. It may serve to illustrate the fact that there are plywood curving techniques that are still a puzzle, even to old timers. The plywood industry has never adequately exploited the potential possibilities of these interesting, attractive and profitable sidelines in its field.

**The End**

## WAYS TO OBTAIN ADEQUATE LABOR

In searching out new sources for potential workers to replace those bound to depart for the armed services and defense industries, there are four important classes to consider: women, older persons, handicapped workers and minority groups. It is suggested that employers analyze the potential work force in their areas, plan for the greatest possible expansion of the work force, through looking to the "fringe" groups, and effective use of all workers in their jobs.

Employers must find the best way to use each person. The government, for its part, must mobilize the will of the people to fit themselves properly into the mobilization effort.

Here are specific recommendations given by E. L. Keenan, deputy director of the Federal Bureau of Employment Security.

1. Set up manning tables and replacement schedules similar to those used in World War II.
2. Take all steps to determine the cause of turnover and absenteeism.
3. Discourage hoarding of personnel, pirating from other employers, indiscriminate advertising for jobs and wholesale migrations.
4. Undertake in-plant training and upgrading of present employees.
5. Survey the local supply and exhaust it before looking elsewhere.
6. Place personnel administration on a high policy level in your store.
7. Cooperate with public employment services.

**MOISTURE REGISTER**

● A fast and easy way to test the moisture content of lumber or veneer. The K2D type shown is used to test finished or rough lumber. We also carry the V2 type for veneer testing. No needles—finished pieces may be tested without marring the surface. The instrument tests accurately as low as 0 moisture content. Portable, fast and accurate, it is guaranteed for one year and comes complete with fabrikoid carrying case.

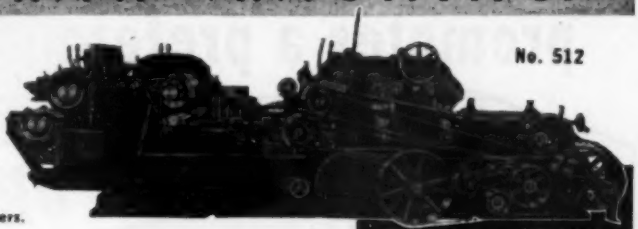
**THE STANDARD DRY KILN CO.**

**798 S. HARDING ST. • INDIANAPOLIS, INDIANA**

# NEWMAN MACHINES

**Newman**

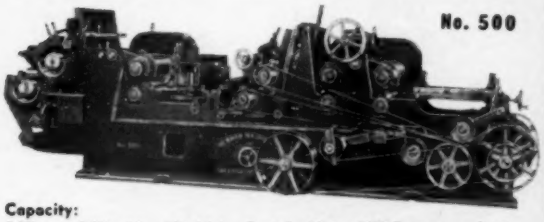
**No. 512**



**Capacity: 16" and 24" wide, 8" thick. Speeds up to 325 feet per minute. 8" dia. cutting circle. Six 12" dia. feed rolls. Single and double profilers.**

## BALL and ROLLER BEARING PLANERS AND MATCHERS

**No. 500**



**Capacity:**
**14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.**

**ORDER NOW FOR EARLY DELIVERY**

**ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.**

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

**HEAD GRINDER**

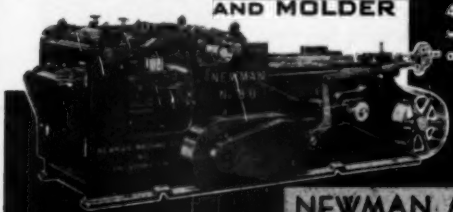
**No. 71**

**Ball and Roller Bearings**

**No. 55 AUTOMATIC PINEAPPLE FEED TABLE**

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

**No. 8-B PLANER, MATCHER AND MOLDER**



The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

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**GREENSBORO, NORTH CAROLINA, U.S.A.**

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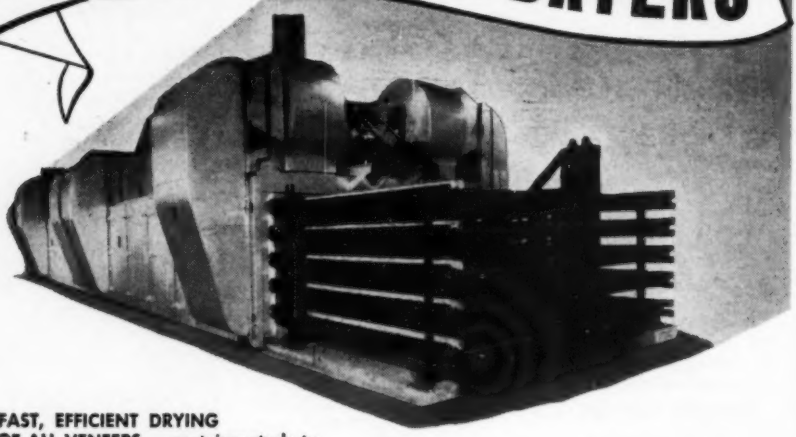
# COE VENEER DRYERS



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**REMARKABLY LOW STEAM CONSUMPTION** ... due to the Coe Counterflow Air System ...

**EXTREMELY LOW MAINTENANCE COST** ... Averaging less than 1% of the original cost ...

**SIZES FOR ALL NEEDS** ... varying from 10½ feet to 153 feet in length, with three, four, or five lines, and capacities for drying 1000 to 60,000 or more board feet every 24 hours.

For more complete information, write for the Veneer Dryer Catalog.

*The* **COE MFG.** *Company*

**360 BANK STREET • PAINESVILLE, OHIO**

# Veneer and PLYWOOD

By Ned Bailey

Part VII

A CORE may be a single sheet of veneer, several sheets of veneer suitably bonded together, or lumber. The best core woods are those of moderately low density and good dimensional stability. Uniformity of grain and ability to take glue are other important considerations. When lumber is used in making cores, edge-grained stock, because of its greater stability, is to be preferred over flat-grained stock. In better quality plywood the most common core stocks are yellow poplar, red gum, birches, soft maple and sound wormy-chestnut.

The stock for lumber cores is usually dried to a moisture content about 5 percent, then surfaced and ripped into strips ¾ to 4 inches in width. All major defects are removed in the resaw operation. The strips are edge-glued together and placed in clamping devices until the adhesive has set. In some of the more modern plants use is made of continuous core-making machines. Machines of this type are often designed for on-the-job work and in most instances are both efficient and economical to operate. Lumber cores usually absorb considerable moisture from the adhesive during lay-up, and must be redried after the glue is cured.

Cross bands are used to balance and equalize stresses in plywood, and they play a significant role in reducing warpage and dimensional changes occasioned by fluctuating atmospheric conditions. Cross bands also minimize checking in thin faces which, if they were bonded directly to a thick core, would be unable to withstand the mechanical stresses developed during periods of excessive swelling or shrinkage. Yellow poplar is regarded by many as the best American cross band material.

A study of ancient pieces of furniture made from plywood, such as the "Cabinet of the King" made by Riesener for Louis XV now on exhibition in the Louvre in Paris, indicates that the natural defects in timber were fully recognized by early cabinetmakers. There is little doubt that the lasting quality of old-time furniture, such as the piece referred to, is the result, in part at least, of the application of the principles of crossbanding.

There are a number of plywood core constructions based largely on the ultimate use of the plywood although the early forms were concerned mostly with plywood's advantages over solid lumber. Plywood gives two marked advantages over solid wood—one is the reduction of swelling, shrinking and warping and the other the fact that

# AMERICAN STREAMLINED COMB GRAINED VENEER

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We are now in production in our new plant, using most modern methods, equipment, and techniques to manufacture door stock in all thicknesses.

HIGHEST QUALITY
OAK, — MAPLE, — POPLAR,
SILVER ELM & WALNUT
SLICED AND ROTARY CUT
VENEER

(In Single Ply Only)

**HILL BROTHERS VENEER COMPANY INC.**

EDINBURG, INDIANA


beautiful though fragile face veneers can be safely used when properly reinforced with other layers of plain veneer or lumber.

Plywood cores now play a very important part in plywood construction and use. There are lumber cores, cores from plain strips and layers of veneer, the intricate lattice work interior core used to reduce weight and improve insulating qualities and fireproofing materials to help make beautifully veneered doors fireproof.

Lumber core plywood is usually made in 5-ply as it provides better strength, balance and appearance, whereas the 3-ply lumber core construction is usually adopted because of cost considerations. While cheaper to make, the lumber core in 3-ply plywood must be of better quality since core defects are more easily apparent than they are in 5-ply construction.

A lumber core in its simplest form is that made with random-width core strips glued to edge, and the strips not ordinarily over 3 inches wide. Strips that are ripped apart and used adjacent to one another are turned or reversed to reduce any tendency to warp. Perhaps the best results are obtained by using strips of standard widths say 2 or 3 inches, ripping them on a gang saw to get uniform widths. These short strips can be butted together endwise, reducing warpage and twisting tendencies and getting more economical use from the lumber.

Where plywood is used in the manufacture of furniture there are many instances when exposure of end wood is objectionable for several reasons. Rails or bands across the ends of the core strips will largely overcome this difficulty as it gives side-exposure all the way round except at the ends of the bands. Making the rail or band of the same species and face veneer gives an excellent appearance.

Plywood construction used in doors is quite varied, from the simple conventional type door with plywood panels and solid stiles and rails, to the flush door made like a desk top. A door of superior quality is made with 3-ply stiles and rails, in which the grain

direction of the outer veneer and the lumber core are parallel.

In this type door the center core is usually of the small pine blocks used in the standard flush door, and the two outer edge strips of the lumber core are of the same species as the face veneer and the panel to be inserted. Therefore there will be only one species of wood visible when the edges of the 3-ply members are trimmed and molded.

The standard flush door found in most schools and hospitals is usually of 5-ply construction with a core of pine blocks and the conventional faces and cross bands. These small pine blocks used in the core are very often surplus cuttings from sash and door manufacture. These door cores are generally railed or banded along the two edges by continuous strips of the same species of wood used on the veneer face. For protective purposes end rails are placed on top and bottom of the door core.

Intended for interior use is another type flush door that has a semi-hollow core of the honey-comb or box construction. This type door is light, fairly sound deadening and is made with large enough edge strips in the core to take care of the necessary hardware panels. These are usually 3-ply, made separately then glued to the lattice-type core. The lattice strips are made of either wood or synthetic fiberboard material. Most types of flush doors can be made with inner layers of metal or asbestos for fire resistance, or lead linings for X-ray rooms. A fire resistant door is also made that has a solid core of fireproof material which is covered with veneer, yet rates a fireproof door designation by its manufacturer.

Plywood with a lumber core is as a rule preferred for such things as furniture, radios, upright pianos and most other similar types of cabinet plywood, as compared with all-veneer construction. These lumber cores are seldom used where the plywood is less than $\frac{5}{8}$ inch thick and for furniture $\frac{3}{4}$ inches thick. Such plywood is usually referred to as top consideration largely


*Prompt Mill Shipments*
*on* **SAWED VENEER**

For manufacturers of Flush Doors, Special Millwork and Office Furniture, AETNA offers prompt mill shipments on Sawed Veneer Face Stock in thicknesses from 1/20" to 1/4" in these species:

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| Plain White OAK | Rift Red OAK |
| Quartered White OAK | Plain WALNUT |
| Rift White OAK | Plain CHERRY |
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Direct mill shipments on:
Quarter Sliced PHILIPPINE MAHOGANY VENEER in 1/20", 1/16", 1/12", 1/10" or 1/8".

*Write today—sending your complete specifications. Aetna will quote you prices and delivery schedules.*

DEPT. V
**AETNA PLYWOOD & VENEER COMPANY**
666 N. Lake Shore Drive *SUperior 7-1637* Chicago 11, Illinois

because it is used for table tops, bureaus, buffets and similar items. Thinner plywood, known as panel construction and made of all-veneer layers usually runs ⅜ inch thick or less.

Lumber cores, composing as they usually do about 80 percent of the total thickness of a top are very important. The core not only functioning as a strong firm base for the decorative veneers, but imparting the structural strength of the piece of furniture as well.

There are several different types of lumber cores: standard cores of random core strips none wider than 3 inches; cores with butted joints in the core strip; flush door cores as previously described; railed or banded cores; cores with mitered rails (at all four corners); cores for semi-circular table tops that reduce end-wood exposure and core construction permitting for hinged cut-outs.

Core joints vary also according to the ideas of the manufacturer making them. There is the jointed or plane joint which produces an inconspicuous line between the core strips; rip-saw joints used most generally; the Linderman joint, with a dovetail tapering in such a manner as to draw the joint tightly together and tongue and groove joints that center and level the core strips when they are glued and clamped.

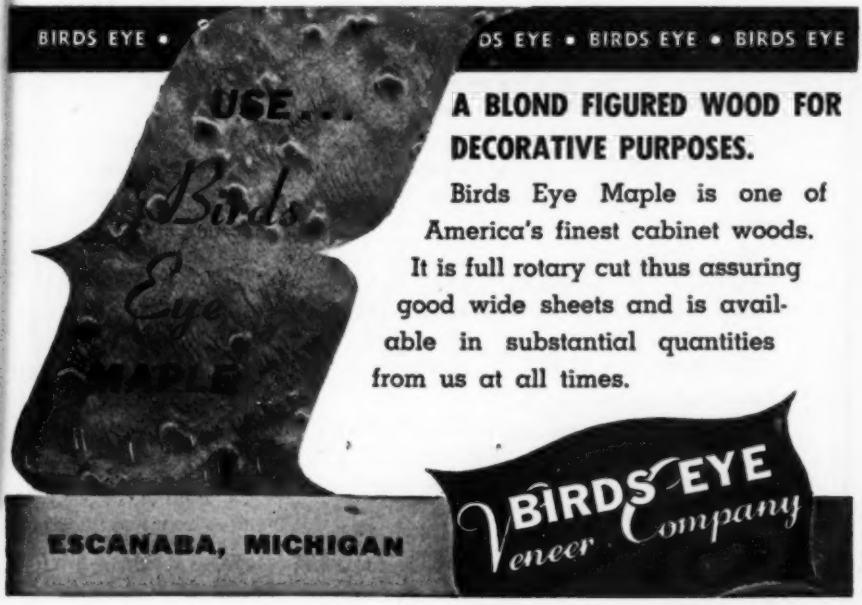
**The End**

## HANNA CELEBRATES 50 YEARS

Hanna Engineering Works, Chicago manufacturer of hydraulic and pneumatic cylinders, valves and riveters, is celebrating its fiftieth anniversary this year.

The company was founded in 1901 by Elmer Ellsworth Hanna in a plant at 2059 Elston Avenue. Incorporation of Hanna Engineering Works followed in 1903.

War production in 1917 forced expansion of the company to provide for additional facilities and equipment so Hanna purchased its present plant at 1765 Elston Avenue.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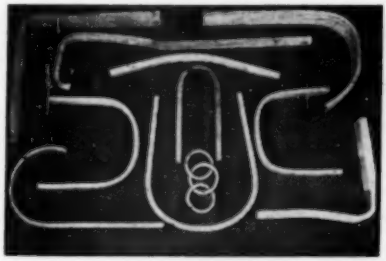

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by using our GRAPHITE COATED CANVAS. This acts as a lubricant, reducing friction against back of sanding belts, increasing their life and speeding up operations. Used on endless belt, edge, chairback sanders and handblocks. $6.50 per yard 35½" width, $1.20 per yard 6" wide, f.o.b. Chicago. Other widths proportionate cost. **Export shipments 10% additional. EXTRA HEAVY Graphite Coated BELTING available at $10.75 per yard, in 36" width.**

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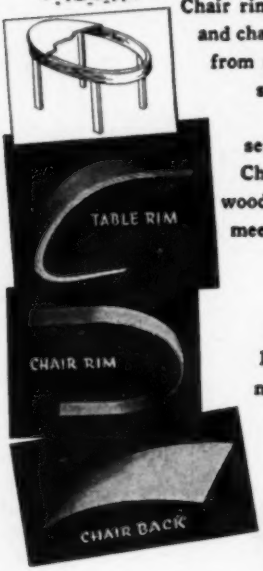
AT PRODUCTION PRICES
with KALWOOD
MOLDED PLYWOOD SHAPES



Chair rims, table rims and chair backs made from standard dies save you new die cost and set-up expense. Choice of hardwood finishes to meet your needs.

Find out how Kalwood can cut manufacturing costs while increasing salability of your products. Write for Kalwood catalog and estimates today.

Keller PRODUCTS, INC
Manchester 47, N. H.

## CONTROLLED MATERIALS PLAN

Beginning with July 1, the Controlled Materials Plan will go into effect, we are told. Under this plan, defense and defense supporting production will be programmed and essential materials made available, using the same common denominators as in World War II—steel, copper and aluminum. At the same time National Production Authority will encourage other production to continue to the extent that materials are available and other NPA regulations permit.

As in World War II, products programmed under the CMP fall into two categories: "A" products and "B" products. "A" products are those where the most convenient form of authorization is vertical. Producers of "A" products get their production authorization

**This news of the Controlled Materials Plan has just been received as we go to press. WOOD WORKING DIGEST will carry additional information in later issues.**

WHAT DOES IT COST TO EXPERIMENT?
When you let Onsrud supply your router bits and shaping cutters you take the question mark out of your cutter costs. Experimentation can be a tax on your profits . . . eliminate this risk with dependable, quality cutters from Onsrud. Modern machines, volume production, and the latest equipment for heat treating combine to give you quality at low cost. Write for Onsrud Cutter Catalog 44-S.
HAVE YOU TRIED ONSRUD
Carbide Edge
ROUTING BITS?
When you're routing materials that are tough on cutting edges . . . resin bonded plywoods, for example . . . try using a carbide edge bit. You'll get as much as 20 times the wear at a cost not much above high speed steel. Write for prices.
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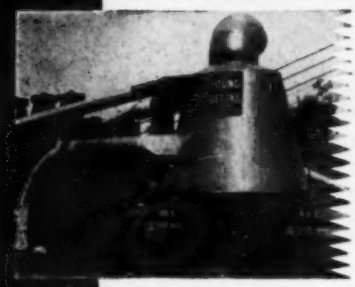
and material allotments from their customer, a government agency.

The "B" list programs will include products where it is most practicable to furnish authorization horizontally or directly to the producer. This will include certain civilian-type products, industrial machinery and equipment and components needed for defense. Producers on the "B" list will obtain their authorizations and allotment from their NPA Industry Division. After the first three months of operation, it is planned to decentralize CMP and handle authorizations, etc. through field offices.

The program has been set up, we are told, so that it will not be necessary to risk serious delay in the production of arms and essential expansion of our production strength. A simple priority system, using Defense Order (DO) has been in effect. However, the impact of the defense program is mounting and additional regulations are believed necessary.

"While the Controlled Materials Plan

# YOUR PARTNER in increasing your profits



## An Adequate Dust Control System

Yes, an adequate dust control system in your plant is the same as another partner working for the good of your business. It improves the efficiency of your machinery and raises employee productivity.

Young and Bertke engineers design and install dust collecting systems that are the last word in efficiency and renovate obsolete or inadequate existing systems so that they do an efficient job for you.

Let us show you how a Young & Bertke Dust Control System can help you increase your output and save you money. Write us today.

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is the best plan yet developed to assure all of us that essential production can forge ahead with minimum delay and disturbance, it is no miracle plan or cure-all. It cannot itself increase the total supply of steel, copper, or aluminum; it cannot eliminate all hardships throughout industry. It is no substitute for the enterprise and ingenuity of the businessman."

Producers affected by the CMP will have plenty of time to brief themselves on procedures, we are told. Forms, operating instructions and the official "B" list will be available in May. Copies of regulations and procedural forms will be available to businessmen through the Department of Commerce in Washington and its field offices.

### HASTINGS SALES MOVES

Hastings Sales Engineering Company, distributors of the Milliken nailing machine, are moving their offices to 739 Boylston St., Boston, Mass., June 1.

# WOOD WORKING DIGEST WINS AGAIN!

Received as we got to press. Word from the National Safety Council that WOOD WORKING DIGEST has again been recognized in their national contest as performing exceptional service to safety in 1950. We received a similar award last year for our recognition of safety during 1949. Herewith follows part of the letter of congratulations:

"It is a genuine pleasure for me to inform you that your organization has been voted the National Safety Council's Public Interest Award for 1950.

"We are very proud to confer this public recognition for exceptional service to safety, and are extremely grateful to you . . . Heartiest congratulations — and our sincere hope you will continue to support safety so aggressively."

The letter is signed by the National Safety Council president, Ned Dearborn.

The editors and publishers of WOOD WORKING DIGEST are glad to have served our industry in this way during 1950. We believe that our part in helping the industry lower its tragic accident rate and develop a safety conscious attitude is well worthwhile. Help us, will you, in giving safety an important place in your own plant? Safety pays for employer and employee alike!

Then let us hear from you as your safety program develops and you lower your plant's accident severity and frequency rate.

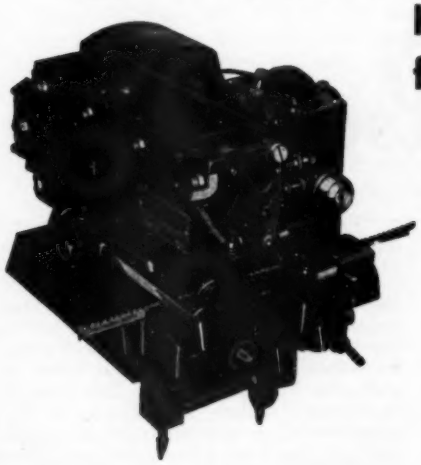
"Be careful . . . the life you save may be your own."

---

"Who introduced you to your wife?"
"We just met. I don't blame nobody."


## Insert Saw . . . then forget it

## K5 does the rest . . . files, sets, joints



K5 files, sets and joints band saws in one set up. It formerly required two machines to do this work. Now one can do both and in addition do it in half the time. The saw is rigidly locked by steel cam while being filed and set. The teeth are filed and set and joined with absolute uniformity. The result yields cleaner, faster cutting with longer periods between replacements.

*Write for Bulletin K-5—The Wardwell Mfg. Co., 3161 Fulton Road, Cleveland 9, Ohio*

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Maker of the largest line of saw and tool sharpening machines

Style No. 1
MONOGOGGLE
GIVES PROTECTION
Plus Wide Angle Vision
The Willson MonoGoggle gives front and side eye protection. Its one-piece plastic lens gives wide angle vision and has excellent impact resistance. The good fit provides all-day wearing comfort. Can be worn over prescription spectacles. For full information, ask your distributor for the Willson Industrial Safety Catalog or write direct.
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**REASONS FOR A SAFETY PROGRAM**

An injury frequency analysis of 41 major industries has been completed and covers more than 13 billion manhours. This analysis shows the average disabling injury rate was 10.14 for each million manhours of exposure; the rate for the wood-products industry was 23.25. The lumber industry had the highest rating of any of the 41 with 47.72 disabling injuries for each million manhours of exposure and only four industries, including the lumber industry, had a higher injury rate than the wood products industry.

Another analysis made by the U.S. Dept. of Labor with the state labor departments shows a wide variation in the woodworking machine safety codes in different states—21 states have no code for this machinery. This lack of uniformity makes it difficult or impossible for a manufacturer of woodworking machinery to design a machine or guard acceptable in all states.

Could there be a relation between the results of these two surveys?

# THE H. R. Q.

## (HUMAN RELATIONS QUOTIENT)

# AND THE SAFETY FACTOR

BY JACK DUNHAM

WHEN you remember that in the last ten minutes two people have been killed and 200 injured with a cost of $135,000 it is very easy for us to picture safety as a phase of our industrial and economic system.

Our accident rates can be controlled on a national scale by applied human relations. When we stop to think that the people who work for us, the people who make results possible, the people underneath their skin have the same desires, the same convictions and the same search for satisfaction from their jobs that we have, then, and only then, will our accidents decrease.

It is not enough that industrial people use human relations in their accident prevention programs—we need in our schools a new "R" with reading, 'riting, and 'rithmetic. We need relations—human relations. Our schools and universities are operating too much on an assembly line basis with no thought to the teaching of basic fundamentals in getting along with people.

I was taught in one of the leading Southern universities that achievement, the winning of success and the high prizes of life were matter of course rewards for one with a high I.Q. And if I had that I.Q. I would be handed success on a silver platter. Was I surprised when I walked into several newspaper offices for that silver platter job. What was lacking? Only one basic principle —the art and science of knowing how to handle people.

Today we know that H.R.Q.—Human Relations Quotient — determines not only the speed and extent of our career advancement, but also controls our attractions of all the high prizes of life.

Let's take a look at a survey made by Harvard University which completely disproved the old I.Q. theory. This survey showed that of the 4,374 men who had failed as employees only 34.2% failed through lack of technical knowledge, while 65.8% showed these adjustment factors to be largely a matter of human relations. Imagine 2,879 men out of 4,375 failing because of human relations deficiencies.

Today our national accident rates are caused from failure in H.R.Q. and strange to say industry and its leaders, government and its leaders shrug their shoulders and say, "Well, there's nothing we can do about it!" "We can't control peoples' mind"—that is about the silliest statement I have heard made.

When we stop to analyze the causes of accidents and find that 88% are caused by unsafe acts of human beings we certainly can't shrug off that figure.

We again will get that big bug-a-boo question, "How can I handle it?" Let

me answer that this way. Accident prevention through human relations on a national scale is no different from any other national objectives we may have —except that it's more important.

Even though we missed out in getting the "4th R" in school and probably missed it in our university of hard knocks, we can acquire the basic fundamentals as easy as a,b,c. The basic ten fundamentals which appear here follow no set pattern, but they are the things that must be taught by our schools, practiced by our government and used by our industries if our loss of lives and economic loss is to be decreased.

1. Cooperation—a cheerful, all-out willingness to help the other fellow, or work with him in harmony.

2. Honesty—is the best policy and the only policy for survival. Honesty with others is the heart and essence of the motto: Live and Help Live.

3. Tact—the miracle worker of harmony, the oil of consideration which dispels friction—the marvel that gets people to say "yes" when you want them to act in accordance with your desires.

4. Friendliness—the magic which warms the heart, gives the other fellow the satisfaction of approval and a sense of belonging.

5. Graciousness and Intelligent Respect for Others—remembering that to each person his own personal interest is of vital concern.

6. Courtesy—respect for the other fellow's dignity and polite recognition of his basic urge—the desire to be important.

7. Enthusiasm—Emerson said, "Enthusiasm is the parent of everything good in history . . . All vigor is contagious, and when we see creation we also begin to create."

8. Poise—self confidence, master of a situation, emotionally, physically, intellectually, the best offensive in any encounter.

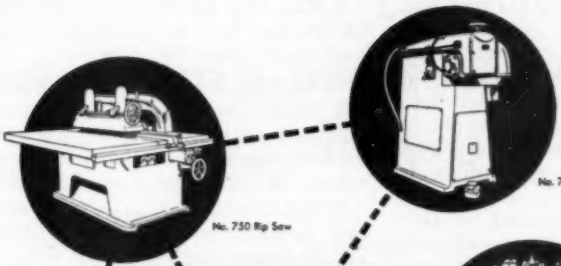
9. Personality—warm up your smile, strengthen your handshake, sparkle with cheerfulness, hopefulness and optimism.

10. Imagination—the thing in the mind which brings clearly into focus the way ahead; explores unknown possibilities. Imagination translates the intangible into the tangible—the impossible into the possible.

There have been many national and world changes since the Industrial Revolution. What has not changed is human nature. Naturally minds are better informed and trained, but the mind works just about as it worked ages ago. Over the ages mankind has acquired a very thin veneer of civilization, religion, culture, convention, but once that veneer is scratched, then we find the body and emotions of countless centuries ago. Primitive minds, emotions and bodies must meet modern conditions.

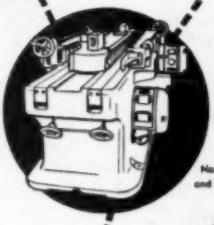
The amazing thing today is that a great number of executives, personnel men, supervisors and other members of management throw up their hands and yell about attitude, poor quality and low production. I am perfectly willing to admit that there are a few people—a very few that are indifferent. We should remember, however, that many indifferent workers started to work with companies expecting to cooperate. Something has happened in the meantime. This does not mean that the people with a pattern of loafing or indifference are free from blame, but they were accepted by the company. Either the company did a poor job of hiring or it has failed to sell a bill of goods. The company cannot dodge the responsibility.

Since the executives and supervisors cannot be everywhere at the same time, they are actually at the mercy of their subordinates. They and the company

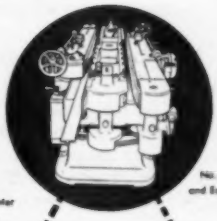


No. 730 Rip Saw

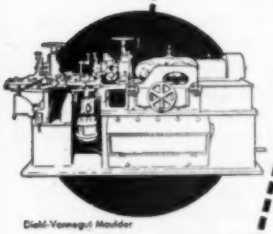
No. 725 Straight-Line Cut-off Saw



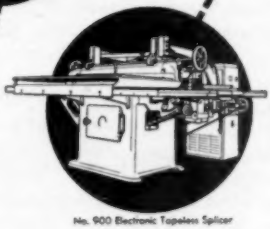
No. 660 Glue Jointer and Edge Moulder



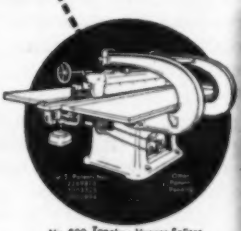
No. 89 Veneer Jointer and Edge Gluer



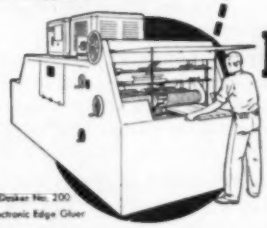
Diehl-Vanneguti Moulder



No. 900 Electronic Tapeless Splicer



No. 890 Tapeless Veneer Splicer



Diehl Dasher No. 200 Electronic Edge Gluer

# FLOW-CHART *for Profit*

Build your operation around the Diehl machines shown here. That's the sure way to set up a flow of work to return the best manufacturing profit.

For Diehl machines of every type have been proved the leaders in their field . . . each designed and manufactured "where precision craftsmanship is honored" — as it has been over the past 40 years.

You're sure to speed production, guarantee quality, reduce rejects, with dependable Diehl Woodworking Machines, pronounced by leading operators and superintendents everywhere as woodworking at its best. Ask your Diehl dealer to show you how Diehl equipment can help you set up a **flow chart for profit.**

ALSO: Edge Gluing Machines, Cutters and Cutterheads, Cutter Grinders, Cut-off Saws, Saw Sets, Glue Pots and Conveyors.

*On the Banks of the Wabash*

THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U. S. A.

will succeed only to the extent that they use existing skills, character and personality and increase additional wants to do a job better. We hear a lot about leadership. A great leader does not lead. Rather, he trains people to lead themselves. When it is remembered that when two people meet there is instantly and constantly a flow of feelings—indifferent, pleasant or unpleasant, the great importance of good human relations is recognized.

If companies had really adequate records, they would be shocked to discover how many people are losing money for the company and to realize how many operations are run at a loss, thus reducing the total annual profits. If business actually measured, improfitable conditions would be instantly apparent and there would be fewer mental shrugs whenever human relations are mentioned.

Having found the sources of loss, it is possible by several methods to turn loss into profit. Whatever method is used, only zest and enthusiasm can produce the maximum profits. Every effort should be made to reach the inner man to want to do a better job.

Taking for granted that occasionally some no good worker or emotional infant slips by the employment office and the supervisor has honestly used the basic fundamentals of the affirmative approach to better human relations and has failed to motivate the individual and that the employee has not responded to or appreciated fair treatment, it may be necessary to move in on him with a negative motivation.

Here is a negative routine that can be used after everything else and everybody else have failed.

1. Be sure every affirmative approach has been tried.

2. Be willing to admit that a bill of goods has not been sold.

3. The supervisor or executive should re-examine himself and his methods.

4. The case should be restudied for any missing facts, or for faults that may have aggravated the case.

5. Be sure the records are complete.

6. Notify the offending worker that you wish to see him. If he is a gentle soul make it soon. If he is a tough customer, let him sweat it out for a while.

7. Let him tell his story. Try to get him to retell it. Your objective is to get a picture of his state of mind, and let him play all his cards while you hold back your aces.

8. After he has said all he can in his defense, and not until then, ask him where he has fallen down.

9. Use the alternative and request: "Are you satisfied with your conduct on this job?" You have him in either case. If he says "no" you have a good starting point. If he says "yes" he either means it or doesn't. If he says "yes" and really means it, the supervisor certainly hasn't made his position clear up to now or the employee is too stupid to know what it is all about.

10. The implications are clear—a reprimand is in order. But you can bet your life the executive or supervisor better be 100% right on the past treatment of the case and on the facts.

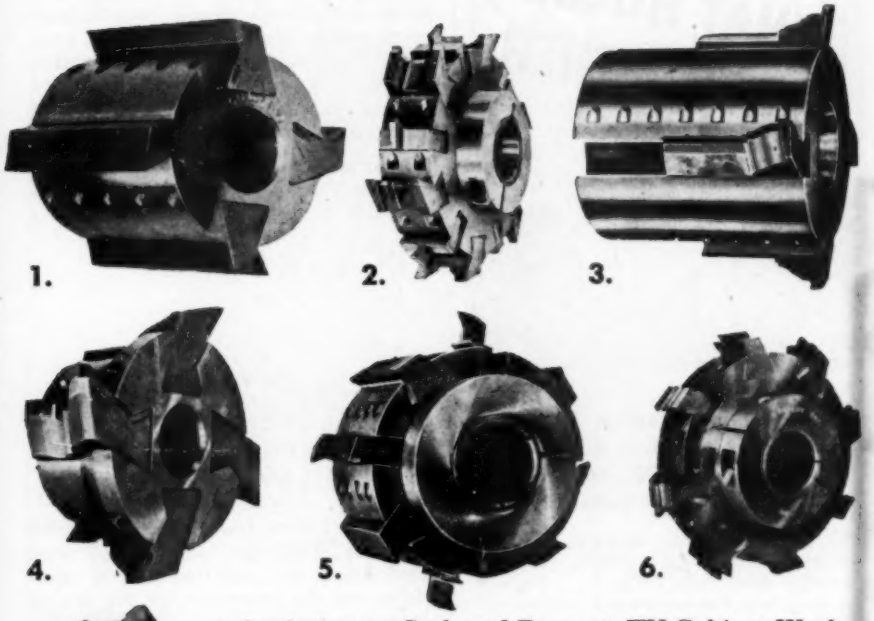
11. The culprit should be given an opportunity to save face if possible by getting him to agree on questions such as: "Can we depend on you to help us?" or "Can you do this or can't you?"

12. If all this has failed, move in hard; give him the straight truth in the fewest number of words. Put him on the defensive and keep him there. You are forced to give him a definite order and here it is. Finish the interview quickly, and get him back on the job. Let him understand he will be under close supervision.

13. Give him a chance to grow. The close supervision is a crutch until he learns how to work.

14. Resume the affirmative motivation

# Marcoloy Carbide Knives are cutting production costs on many different jobs



1. Surfacing. **2.** Sash and Door. **3.** TV Cabinet Work. **4.** Silver Chest Work. **5.** Case Goods. **6.** Flooring. **7.** Moulding.

## WHAT'S YOUR PROBLEM?

You may have the recommendations of Marcoloy engineers for the asking. Just send us a sample of the work, along with the necessary machine information.

MARCOLOY CARBIDES

## Marcoloy, Inc.

**Springdale, Conn.**

***The fastening problem has been successfully solved in hundreds of cases with ST. JOE Stapling Machinery . . . and inexpensively too!***

ST. JOE Stapling Machinery automatically forms and drives its own staples from coils of wire . . . a big saving over the preformed staples. Where your **holding problem** requires **holding power** consider a ST. JOE Stapler for the fastening on wood, veneer, cloth, cellophane, fibre, leather, light weight metal or a combination of these materials . . . consult a St. Joe Engineer, we are specialists in the stapling container field and have been since 1877.

"IT'S ST. JOE TODAY!
. . . FOR STAPLING MACHINERY"

**"Since 1877"**

**St. Joe Machines, Inc.**

ST. JOSEPH, MICHIGAN

and continue as long as he continues to grow. If there are no signs of growth in a reasonable time, there is nothing else to do. The company can't afford to retain him.

I have tried to talk about both the affirmative approach and the negative approach to good human relations. The force that propels people permanently never comes from outside. It can only come from within. Once this fundamental is thoroughly understood, the boss disappears and the real leader takes over.

If used properly we will emerge with a formula that will give us professional status in the art and science of human relations.

That formula would be:

| | |
|---|---|
| MAKE IT | Easy<br>Safe<br>Comfortable |
| FOR THE | Child<br>Subordinate<br>Other fellow |
| TO | Confide<br>Admit shortcomings<br>Suggest self improvement |

You say, what has all this to do with accident prevention and safety? Just this. Until we understand that accidents can be prevented by the use of human relations, I am afraid the 88% will still be with us.

**The End**

## "KICK-BACK" APRON

Industrial Products Company announces a new protection apron for men who operate power driven saws.

Experience has shown that in many plants the hazard of forcible ejection of lumber against the body exists, oftimes resulting in a severe blow to the abdomen, causing internal injuries, always a serious lost time accident and in many cases resulting in death.

The design of the IPCO Sawyer's "kick-back" apron allows for protec-

SPEED

# Your Production! Raise the quality of Your Planing!

*No. 380-A*
*PLANER*

## THE PRECISION PLANER

There is NO SUBSTITUTE for Quality! Price alone is never a true gauge of value. Power Planers offer PREMIUM VALUES at standard prices. Eighty-three years of quality manufacturing back our claim to PRECISION WORKMANSHIP. Thousands of satisfied users are our best advertising. The Model 380 Planer is modern—rugged—compact—safe—but, most of all, it's TOPS IN PLANING.

**HIGHEST QUALITY SINCE 1867**

**Planers - Tenoners - Planers & Matchers**
**Resaws - Band Saws - Power Feed Rip Saws**

**L. POWER & CO.**
2823 Oakford St.
Philadelphia, Pa.
*Manufacturers of POWER Machinery Since 1867*

YOU'LL PROFIT 5 WAYS with MOISTURE REGISTER

**With Moisture Register instruments you**

- **Make sure your lumber meets moisture specifications for grade.**
- **Save freight costs. Don't pay for excess moisture.**
- **Save man hours, Moisture Register tests in seconds. Oven tests take hours.**
- **Save on overhead. Wet lumber increases tool maintenance.**
- **Reduce customer complaints and rejects. Insure consistent production quality.**

**With Moisture Register, you know that wood will be exactly right for most efficient bonding, cutting, fitting and finishing.**

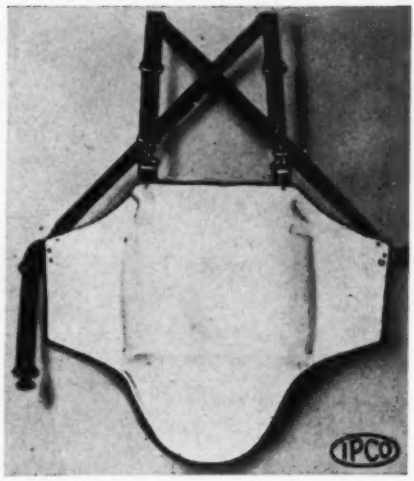
Testing moisture content of panelling with Model RF4 at Morris Furniture Company, Los Angeles, manufacturers of high quality furniture.

**Models priced from $75.00 to $148.50 test 80 wood varieties, 0 to 25%, in 3 seconds or less. Rugged, portable. One-year guarantee. Write for complete information.**

**10-DAY FREE TRIAL** on any model! No obligation. Write today, outlining your requirements.

ELECTRONIC MOISTURE REGISTER

Mfd. by Moisture Register Co.
1510 W. Chestnut St.
Alhambra, Calif.


tion from the diaphragm to below the waist.

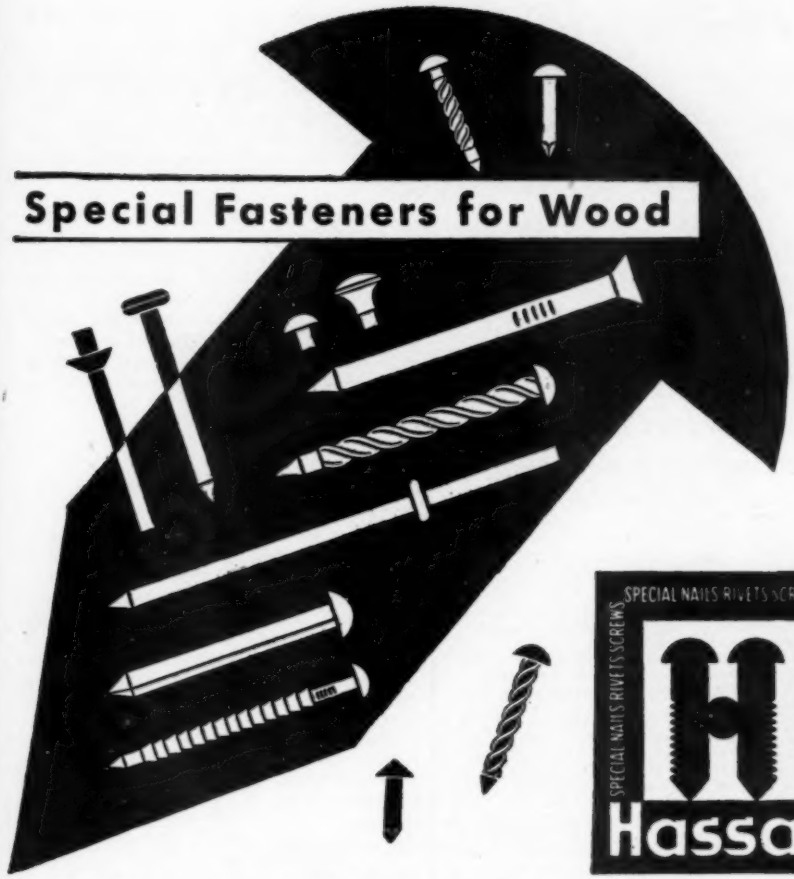
The apron has a heavy fibre shield on the inside, bound and strapped in convex position to cover the abdomen. Back of apron padded with hair felt for comfort and additional resistance in absorbing the force from a "kick-back." Padding is tufted to hold it securely in place. Outside covering of white heavy canvas. Sturdy web shoulder and waist straps are adjustable to the wearer.

Full information may be obtained by writing to Industrial Products Company, 3142 N. Fourth Street, Philadelphia 33, Pa.

## NEW SAFETY KITS

Keyed to stepped-up production in many industrial plants, and the employment of many new workers, Towmotor Corporation, Cleveland, is providing this helpful "Safety Kit" to manufacturers in many areas.

Prepared in clear, bright colors with large type face to emphasize their safety message, four interior plant signs caution truck operators of "Blind Corners," "Traffic Crossings," "Low Head Room," etc. Four brightly hued posters are included in the safety kit, each emphasizing in eye-catching cartoons



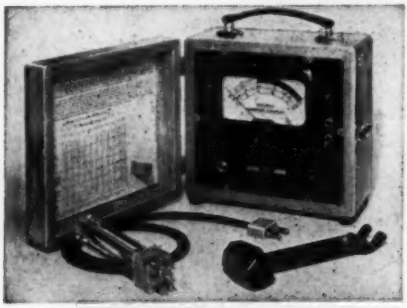

**HASSALL** special nails, drive screws, annular threaded screws to order for your specific use . . . Made in diameters starting at .024 —lengths up to 7" . . . Variety of metals, finishes and secondary operations . . . Nails of uniform length, gauge and heads for machine driving . . . Also rivets and other cold-headed specialties to order . . . Economy, quality and quick delivery in large or small quantities . . . Tell us what you need . . . We will answer promptly . . ASK FOR FREE CATALOG . . . 3-color Decimal Equivalents Wall Chart free on request.

# JOHN HASSALL, INC.

**410 OAKLAND STREET**
**BROOKLYN 22, N. Y.**

MANUFACTURERS OF COLD-HEADED SPECIALTIES—ESTABLISHED 1850

## Prove These Facts Yourself



Delmhorst Moisture Detector, Model RC-1

## Try it 10 days Free! — Cut Costs, Improve Quality 4 Ways

- For rapid moisture tests of any wood product—from timber, poles and lumber, to finest veneers — without loss of material.
- To know whether the wood contains the right moisture content for storage, process or shipment.
- To test the moisture content, distribution or gradient of moisture within a single piece of wood or kiln load.
- To sort stock of equal moisture content for loading the kiln; to tell whether or not the stock is ready to come from the kiln.

**Accurate, Easy-to-Use**

There are no conversion tables required—no calculations to make with a Delmhorst Moisture Detector—merely read the correct percentage of moisture content *direct* from the dial! . . . And you get precise readings not in one, but *three moisture ranges:* 6 to 12% (kiln dry range); 12 to 22% (air dry range); and 22 to 65% (green range). *(The Model RC-1 is fully guaranteed for 1 year, except battery replacement).*

**Send for Complete Information**

Fill in the coupon below to get full details. Better still, find out for yourself the savings you'll make with a Delmhorst Moisture Detector —try one *free* for 10 days without obligation. Mail the coupon *today.*

**DELMHORST INSTRUMENT COMPANY**
BOONTON, NEW JERSEY

☐ Please send, without obligation, a Model RC-1 for 10 days free trial.

☐ Please send complete information.

Name .....

Firm .....

Address .....

City and State .....


some element of safe fork lift truck operation.

In addition, a helpful Operator's Guide is included for the driver of industrial lift trucks. The convenient, pocketsize guide emphasizes safety precautions and driving regulations within the plant.

Coming at a time when the tempo of plant production is being speeded up, with materials constantly on the move, the Towmotor safety program is welcome to plant executives concerned with maintaining high safety standards. Anyone interested in obtaining one of the safety kits can do so by writing directly to Towmotor Corporation, Cleveland 10, Ohio.

### AMERICAN BOX WINS SAFETY AWARD

Safest woodworking plant in Ohio, was the honor bestowed on The American Box Co., 1900 W. 3rd St., Cleveland, a feature of the 20th Annual Greater Cleveland Industrial Safety Campaign, it was announced recently by George H. Kubes, company president. "We lost no manhours due to injuries during the entire year," he stated.

The Safety Award, a yearly citation approved by the Industrial Commission of Ohio, at Columbus, was presented to representatives of American Box; Henry

# DE-STA-CO *Proves*

**"GOOD THINGS COME IN THREES"**

But rarely three as useful as these NEW De-Sta-Co Toggle Clamps. All three answer specific needs for fast clamping and positive holding pressures in production operations — welding, riveting, bonding, machining and assembly. Whatever your product, for efficient, low cost tooling, consider:

**MODEL 235U,** top; Retractable work-holding bar for quick, unimpeded loading and unloading of fixtures. Up to 750 lb. pressure.

**MODEL 424,** left; Portable Plier Clamp, a "baby" for one-hand use in cramped work areas. Deep jaw capacity altho only 4½" over all.

**MODEL 650,** right; Plunger Clamp for heavy duty "push-pull" work-holding requirements. Compact design, develops up to 4000 lbs.

For details on these and over forty other De-Sta-Co Toggle Clamps write for catalog and name of stocking representative near you.

DE-STA-CO **DETROIT STAMPING COMPANY**

**312 MIDLAND AVE. • DETROIT 3, MICH.**


S. Kubes (right), Vice President, and Edward A. Kubes (left), Production Superintendent.

The Cleveland firm is one of the nation's "big 5" manufacturers of wire-bound crates, wood cleated panel boxes and nailed wood boxes.

---

"The only way I know to drive out evil from the country is by the constructive method of filling it with good."

—Calvin Coolidge

# FESTO *Semi-Automatic shutter grooving machine*

for cutting grooves in window shutters, doors or anything with loovers. The Cutterhead runs at 9000 RPM and can be adjusted to any angle for left or right horizontal and vertical slots. The grooves are cut to a flat bottom, therefore the beveling of the edge on the slots is eliminated. The clamping, the infeed and the grooving is performed with one lever movement. This and the fast cutter-speed makes this a very rapid operating machine.

Other FESTO equipment includes single-end tenoners, chain-mortising, drilling, milling machines. Circular saws, radial saws, polishing machines, sanders. Write for catalog and price data.

## SPECIAL WOODWORKING MACHINES

**745 — 51st STREET, BROOKLYN, N.Y.**

# WWD Industry Notes

## GRADING SCHOOL

Eighth term of the John W. McClure School of the National Hardwood Lumber Association will begin September 15, 1951 and end February 14, 1952. Registration for the term will be opened on July 1, but those on the waiting list will receive first consideration. The capacity of the school, held at Memphis, Tenn., is 50 students. Although non-members are not denied admission, preference must be given to applicants sponsored by members of the association. During the term the students study and master the intricacies of hardwood grading standards, their accurate application and fundamentals of hardwood lumber trade.

## PAISLEY RESUMES EXPANSION PROGRAM

Further interior remodeling and construction of additional manufacturing facilities is going forward at the Chicago plant of Paisley Products, Inc., industrial adhesive manufacturers. The estimated cost of Paisley construction work is $60,000. The enlarged storage area resulting from the construction project will provide space for an additional 1,000,000 pounds of raw materials and finished goods.

The Company has also opened two new offices and assigned several changes in territory: Iven G. Nichol is now handling western Pennsylvania and portions of West Virginia; Art Hess covers the Miami Valley area and the state of Kentucky; Malcolm Robinson will cover an area from Nashville, Tenn. to Fort Worth, Texas; Warren Van Etten represents the Company in central and southeast Ohio and western Virginia; and Robert Swinney has been named for the Kansas City territory.

## G-P OPENS NEW WAREHOUSE

Georgia-Pacific Plywood Company has added its 14th warehouse to its coast-to-coast chain of wholesale distributing units. Newest warehouse is one at 33rd St. and Liberty Ave., Pittsburgh.

## LUMBER COMPANY SOLD

The Detroit Lumber Co., Detroit, Mich., one of the largest and oldest lumber companies in the city, have sold their real estate to the Revere Copper and Brass Company for expansion purposes. The liquidation of machinery and equipment will be handled by J. Lee Hackett Company of Detroit.

## EXPANDS FACILITIES

Consolidated Machinery & Supply Co., Ltd., has expanded its manufacturing facilities at 2031 Santa Fe Ave., Los Angeles, Calif. An entire new building houses the final assembly line for Consolidated's Comet industrial woodworking saws. The Company began business in 1930.

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"Who yer shovin?"
"Dunno. What's yer name?"
**— Veneer Newsletter**

# Appointments

**Victor Olson** has been elected as a new director of the Georgia-Pacific Plywood Company. He is president and director of Washington Veneer Corporation of Olympia, Wash., a subsidiary of Georgia-Pacific.

Ponderosa Pine Woodwork Association has elected **F. E. Bissell, Jr.**, Carr, Adams & Collier Co., Dubuque, Iowa president. **Arthur H. Mohring** of Edward Hines Lumber Co., Chicago, was elected vice president. Other new officers are: **J. D. Rowland**, Anderson Corp., Bayport, Minn., secretary; **Leonard G. Carpenter**, McCloud River Lumber Co., Minneapolis, Minn., treasurer and **D. G. Pilkington**, general manager.

F. E. Bissell, Jr.

Charles E. Klinck

**Charles E. Klinck** of Newton Square, Pa., has been appointed Philadelphia sales manager for the Acme Steel Company.

**Dr. M. F. Browne** has joined the Research department of the Plaskon Division, Libbey-Owens-Ford Glass Company. He will participate in research on glues and industrial resins.

M. F. Browne

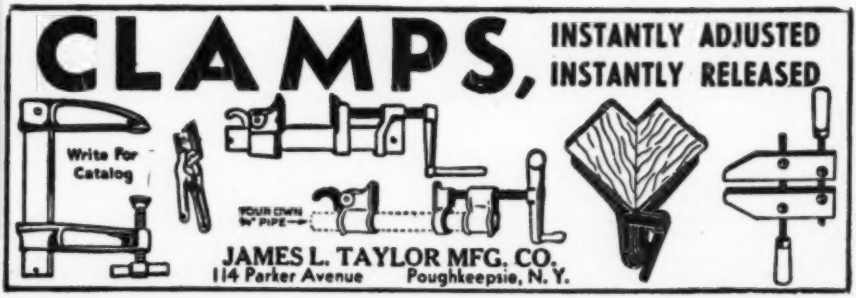
Louis J. Francisco

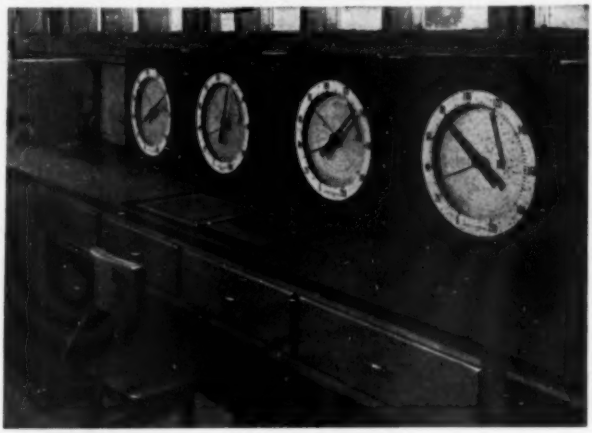
**Louis J. Francisco** is the new vice president in charge of sales and advertising for the Formica Company of Cincinnati. He has worked for the Formica Company since 1924.

Appointment of **Walter P. Arnold** and **Frank H. Fischer** as vice presidents in the wood preserving division of Koppers Company has been announced recently.

George M. Curtis

Walter P. Arnold



**IMRIE**
**ELECTRONIK POTENTIOMETER . . .**
**MULTIPLE THERMOCOUPLE SYSTEM**

This exclusive IMRIE control system assures SCIENTIFIC . . . HIGH QUALITY drying of lumber. No other system of dry kiln control provides the accurate readings and recordings of temperature and humidity at so many points in the kiln . . . plus really DEPENDABLE AUTOMATIC control. Users of this NEW system report faster . . . unusually safe and accurate drying with very low percentage of degrade. IMRIE DRY KILNS are famous for

- HIGH QUALITY DRYING
- SAFETY AND DEPENDABILITY
- HIGHER PRODUCTIVITY
- LOWER COST OF OPERATION

This NEW type of control system coupled with IMRIE Sipho-Fan Kilns means all Imrie users get "PERFECT DRYING EVERY TIME."

*WRITE FOR YOUR COPY OF "ACCURATE . . . SCIENTIFIC . . . ECONOMICAL LUMBER DRYING."

**IMRIE DRY KILN COMPANY**
PEARL & OTTAWA GRAND RAPIDS, MICHIGAN

Both men have been with the firm for a number of years.

Curtis Companies, Inc., Clinton, Iowa, manufacturers of Curtis woodwork, have elected **George M. Curtis** as president of the firm. He succeeds his uncle, the late E. J. Curtis, who died in February.

**E. J. Poh** of Norwalk, Conn., has been employed by the Chapman Chemical Company, Memphis, Tenn., to service millwork plants, fiberboard manufacturers and wood treating in New York, Eastern Pennsylvania, New Jersey and the New England states.

The appointment of **Paul B. Shoemaker** as vice president in charge of sales has recently been announced by the Masonite Corporation, Chicago.

**John W. Squires**, former U. S. Regional Forester in charge of State and Private Forestry in the 14 northeast Atlantic states—from Virginia to Maine—has been appointed to head an expanded Mississippi Products Forestry Department. Mississippi Products, Jack-

son, Miss., manufactures television, radio and phonograph cabinets, sewing machine cabinets for several well known firms.

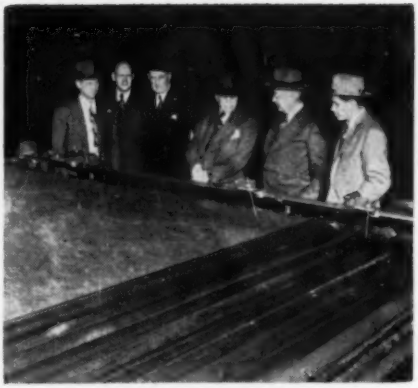
Westinghouse Electric Corp., Pittsburgh, Pa. has named **Mark W. Cresap, Jr.**, as a vice president and assistant to the president.

## INSPECT NEW MASONITE PLANT

Directors of Masonite Corporation made their first official inspection of the new multi-million dollar hardboard plant here recently. The delegation was headed by Eugene Holland of Chicago, president.

The visitors were escorted on their trip through the plant and into the corporations forest tracts over the 35-mile Masonite Road by E. T. F. Wohlenberg, vice president and general plant manager.

Two days were spent here by the directors, who witnessed the various operations by which fir and redwood



**Directors observe the movement of Masonite Duolux, in its wet lap form, toward traveling saws which will cut it into panels.**

logs are transformed into panels of pressed wood, visited each of the ten buildings constituting the plant, and toured the private road which makes the raw material accessible. The sprawl-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ing plant is located one and a half miles north of the city on a 116-acre site.

**J. ROGER WHITE**

J. Roger White, vice president in charge of sales and advertising for the Formica Company, Cincinnati, Ohio, passed away in March. He had been with the Formica Company for 24 years.

**PREFERRED DOORS**

Milady's desire to admire herself full length has created a widespread preference for mirror doors, according to a nation-wide preference survey recently made by Ponderosa Pine Woodwork. Almost 45% of those interviewed indicated that they want mirror doors in their new or remodeled homes.

A decided trend toward the use of Dutch doors was also indicated by the survey. With an ancestry dating back hundreds of years, Dutch doors offer modern advantages to home-owners.

MORE SPEED MORE SUPPORT

MORE WORK

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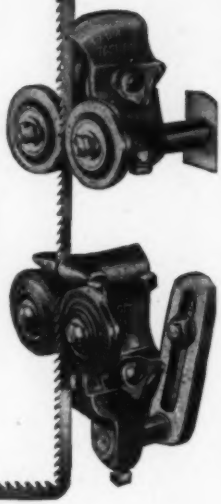

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# GOODSPEED
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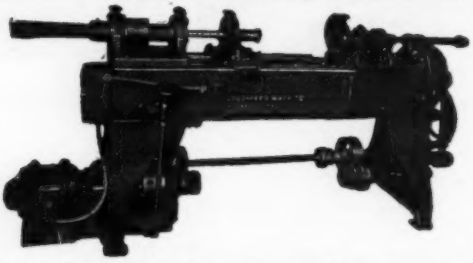

**For various kinds of turnings from the smallest size up to 3" diameter and 7½" long. We can furnish FOUR different types in FOUR different capacities for turnings up to 1½", 2", 2½" and 3" in diameter.**

**Write for bulletins covering these fast money saving lathes which are easy to set up and cover a wide range of work.**

**GOODSPEED MACHINE COMPANY**

WINCHENDON, MASS. -:- U. S. A.

# SETH THOMAS CLOCKS AND RADIO-FREQUENCY DIELECTRIC HEATING

Seth Thomas Clocks, Thomaston, Connecticut, is using radio-frequency dielectric heating to do plywood bonding and assembly gluing better and faster. One interesting example of the radio-frequency heating is the forming and bonding of curved sections of plywood in the manufacture of cases for mantle chime clocks. These clocks known as Medbury, are Westminister chime clocks of Tambour style.

A Westinghouse two-kilowatt, 13.6-megacycle, radio-frequency generator is used for this application, together with a Hannafin type B-55 pneumatic press. Forms or dies are used to produce the desired shapes. The male or top die is used as the "hot" platen; the female or bottom section of the die is bonded and grounded to the frame of the generator.

The operator lays up his stock, inserts it in the press, and presses the "start" button, located by his left hand. The press closes and the radio-frequency generator is energized automatically. At the end of the heating cycle, the press automatically opens, and the operator removes three perfectly formed and completely bonded plywood shells. Rejects due to the dielectric process itself are practically non-existent.

A very important part of this installation is the Black Brothers motor-operated glue spreader, seen in the right foreground. The doctor rolls are heavily chromed, and the spreading rolls are made of resilient rubber. Adjustments built into the spreader enable the operator to obtain almost micrometer-precise adjustment of the thickness of glue applied to an individual ply.

The glue being used in this application is URAC No. 185 with Hardner No. 185 mixed in proportions by weight —ten parts glue to one part hardener. The glue comes in 55-gallon drums, and is stored in a cool place, ambient tem-

Only the best SAW SHARPENING can give you top-speed production. The Foley Saw Filer quickly puts old saws with dull and irregular teeth back in perfect condition—and keeps them perfect! 25% to 40% increase in production is frequently realized with Foley-filed saws.

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permits you to use a Foley Saw Filer in your own shop. You can't lose on this offer—write or send coupon.

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**FOLEY MFG. CO.**
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perature approximately 50° Fahrenheit. The glue in the spreader is continuously conditioned by means of a refrigerated glue pot, which maintains the temperature at 50°F.

One of the greatest benefits obtained from the radio-frequency technique is the simple manner in which a change-over from one die to the next can be made. To change from one type clock shell to another requires approximately ½ hour. This enables the plant to turn out small orders on short notice.

In the background, just behind the press, can be seen the ferris-wheel rotating rack which was used in the gluing process before installation of the radio-frequency equipment. Using hide or animal glue, the minimum setting time under nearly ideal conditions was four hours. There were many humid summer days when it was practically impossible to set the animal glue satisfactorily in any amount of drying time. Contrast this with complete absence of this type of trouble when using synthetic water-resistant glues. Another nuisance factor connected with the older method of gluing was the great number of individual forms needed to complete production requirements. For example, to keep up with production, the Medbury clock under consideration required 33 individual forms. Each form was heavy, bulky, and hand-clamps, and the pressures obtained on the plywood forms would vary from operator to operator.

Since only one form is needed for each different type of shell — as compared with as many as thirty or more with the old method — a considerable savings in tooling for new models is realized.

Storage problems for the multitude of forms required with the old method, including the fact that change-overs to new models are greatly simplified are additional factors in cost economies.

In addition to the plywood bonding applications illustrated, Seth Thomas has taken full advantage of the versatility of this generator. It also is used for stray-field and gluing of the cleats and corner blocks, which must be fastened to the inside of the clock cases

to support the clock mechanisms.

The Seth Thomas management is well pleased with the principle of dielectric heating. They agree with other industrial users that for plywood bonding and assembly gluing, radio frequency does an excellent job.

## BEHR-MANNING OFFERS NEW MASKING TAPES

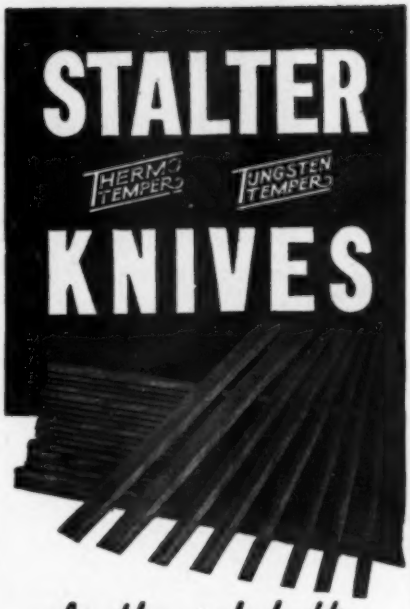
Behr-Manning Corporation, Troy, New York (Division of Norton Company), has recently offered for industrial application, a new line of paper-backed, pressure-sensitive tapes under the trade name Behr-Cat brand masking tapes.

Designed for a wide variety of applications, the new tapes are adapted to masking, as in spray or brush painting; stencilling, as in screen or stencil painting; packaging, as for shipment or storage; sealing, as for dustproof containers; holding, as for loose parts in assembly; labeling, as on goods transferred from original container; and surface protection, as glass from chipping, and equipment in transit.

Correct tackiness for faster application, better flexing to contours, deadstretch that prevents creep-under of paint, thinness that prevents build-up of paint, ideal performance in high temperature work, better balance between tensile strength lengthwise and tear strength crosswise, and "no residue" strip-off in unmasking, are among the quality benefits claimed by Behr-Manning.

## CANADIAN REPRESENTATIVE

A. Ian Brown of A. G. & A. L. Brown Company, manufacturers representatives of Montreal, Quebec, has been appointed to represent the Boice-Crane Company of Toledo, Ohio, in the Province of Quebec and the Maritime Provinces. The office of A. G. & A. L. Brown Co. is at 4932 Sherbrooke St. West, Montreal, Quebec.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*Walter of Wabash*

# WD New Literature Section...

## SYNCO ADHESIVES

A pamphlet prepared to describe the recommended procedures and techniques for the easiest handling of Synco adhesives. Sections of the bulletin are devoted to hot and cold-press plywood, high-frequency gluing, bonding of wood waste, laminating, assembly and joint gluing, bonding plastic laminates, wood repair and veneering of asbestos-type boards. In these sections descriptions of the recommended glues, suggested mixing procedures, preparation of surfaces and time schedules are given. Necessary information on the durability, storage and spreading of these glues is also included.

For literature on their adhesives write the Synder Chemical Corporation, Bethel, Conn.

## HARD CHROME PLATING UNIT

This bulletin features the Chromaster, an industrial hard chrome plating unit. The unit is of sturdy sheet metal construction, has a single stroke mechanical bell timer, built in power supply, work rack consisting of ½" diameter steel rod and adjustable metal work arm for holding cathode lead and supporting work and other features. Successful applications of chromasol plate are given such as increasing the life of twist drills, steel extrusion dies, interrupted-thread taps and others. Data on chromasol solution, used with this unit, is given.

For a copy write the Ward Leonard Electric Co., Dept. WD, 31 South St., Mt. Vernon, N. Y.

## COLD HEADED FASTENERS

Catalog No. 60, presented by John Hassall, Inc., illustrates the vast variety of nails, rivets, screws and other specialties available through the cold heading method. Separated into labeled step-down sections for quick reference, the catalog is helpful and useful to those using metal fasteners in the assembly of their products. Contains many reference tables and the complete descriptions and specifications of the Hassall line.

Write the above Company, Dept. WD, Clay and Oakland Sts., Brooklyn 22, N.Y.

## DEHUMIDIFICATION

A bulletin issued by the Abbeon Supply Company describes the heavy duty dehumidifier and its place in industry. Contains a small refrigerating unit with a large cold coil. Air is drawn over the coil and in this way moisture is taken out of the air at the rate of three gallons a day, it is claimed. What is meant by dehumidification, relative humidity, information on too much humidity, how to remove moisture from the air, where dehumidification serves best and some recommended humidities in various industries are subjects included.

Write the above Company, Dept. WD, 58-08 41st Drive, Woodside, New York, N.Y.

## NEWS FOR WOODWORKERS

A weekly woodworking information

sheet, entitled "Saw Tips," is of value to those interested in solving their woodworking problems and finding new uses for their woodworking machinery. It is designed to give detailed information on woodworking problems brought to the attention of the DeWalt Test Department. Each issue reports in detail one woodworking problem. Recent stories presented were "How to Rip Short Stock" and "Chamfering." Charts and tables are also given.

For a copy write DeWalt, Inc., Dept. WD, Lancaster, Pa.

### R. D. WOOD COMPANY

This 32-page booklet is designed to give an informative picture of some of the 150-year old firm's facilities, methods and equipment, particularly as they relate to the manufacture of hydraulic presses, valves and allied equipment. The work of the engineers, the foundrymen, the patternmakers, the machinists, those in the assembling, testing and shipping is shown in this modern plant.

For a copy write the above Company, Dept. WD, Public Ledger Bldg., Philadelphia 5, Pa.

### SAFETY BOOKLETS

Four new booklets on safety, designed for distribution by plant foremen or as payroll enclosures, have been released by the National Safety Council. Humorous cartoons and light treatment in the text sugar coat the "message."

"Aren't People Funny" illustrates unsafe attitudes, "K.O. Dirt and Disorder" points out the advantages of a clean and orderly plant, "Cry Whoa!" helps to reduce motor accidents and "Safety 'Round the Clock" deals with home safety.

Sample copies may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Illinois.


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# One Man and RAYBOND . . . produces more than 3 rotary clamps

## RAYBOND Electronic Edge-Gluer amazes Merrimack Cabinet Shops

**How efficient and economical can panel gluing be? We asked Mr. M. S. Fox of Merrimack Cabinet Shops, Lowell, Mass., several months after his RAYBOND Electronic Gluer had been on the job. Here are excerpts from his enthusiastic letter (copy on request.) which tell the story:**

**"Operator now produces as much as three rotary clamps . . . cut glue cost 60% . . . plane stock two hours after gluing without sunken joints . . . reduced joint failure 80% . . ."**

**And that's only part of the story. Get all the facts—find out how you, too, can profit with amazing one man RAYBOND edge-gluing—write today for bulletin.**

**Merrimack's RAYBOND Gluer, with one man operation, that produces as much as three rotary clamps previously used.**

**New RAYBOND products—write for information**

- *H-F VENEER on FRAME PRESS
- *H-F EDGE BANDING PRESS
- PORTABLE WOOD-BONDING GUN
- SPECIAL ASSEMBLY JIGS and PRESSES

*High Frequency

**ELECTRONIC HEATING CORP.**

**66 Needham Street**
**Newton Highlands, Mass.**


### ADJUSTABLE LOADING DOCKS

Rowe Methods, Inc. has issued a folder showing on-the-scene applications of adjustable loading docks, which speed up freight handling and mechanize loading operations. The bulletin shows present models, discusses the advantages of savings in deck space, handling time, labor and breakage. Construction features, operation and uses are also given.

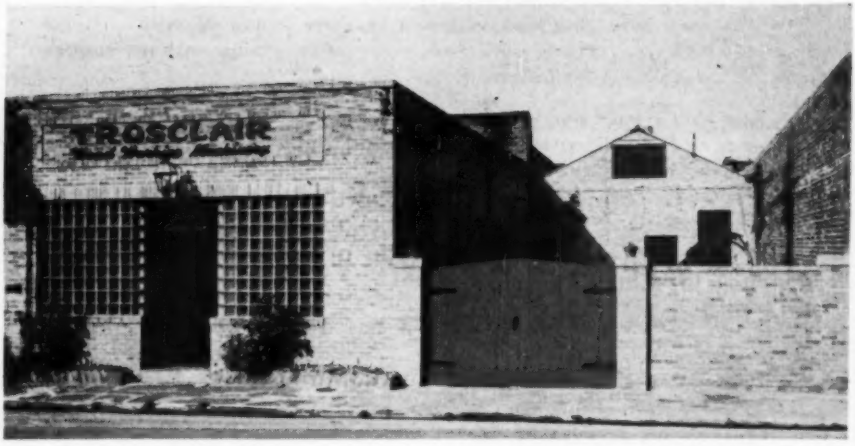
Write the above Company, Dept. WD, 1743 East 25th St., Cleveland 14, Ohio.

### FLEXIBLE SHAFT COUPLING FOLDER

Engineering information for proper application of Link-Belt "RC" flexible couplings is given in folder No. 2363. Dimension, weights, service factors and horsepower ratings are listed. Detailed data are also given on two types of protective grease-retaining casings. The flexible couplings are said to be rugged in construction, easy to install, durable and reliable.

Write the Link-Belt Company, 307 N. Michigan Ave., Chicago 1, Ill.

# For Woodworking Machinery in *The Deep South*




## An Invitation . . .

### To the Woodworking Industry

Not a new name or a new service, but a special invitation to new plants now locating in the deep south.

Contact us for all information on machines used in your wood products manufacturing operations. We have had experience in supplying all types of production woodworking machinery.

We can be especially helpful to you in suggesting ways for utilizing waste products — Refuse; scraps, slabs, etc. Don't burn these money-making by-products! Let us help you convert them into salable items.

*For further information write:*

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**TROSCLAIR** WOODWORKING MACHINERY
319 NORTH DIAMOND ST.
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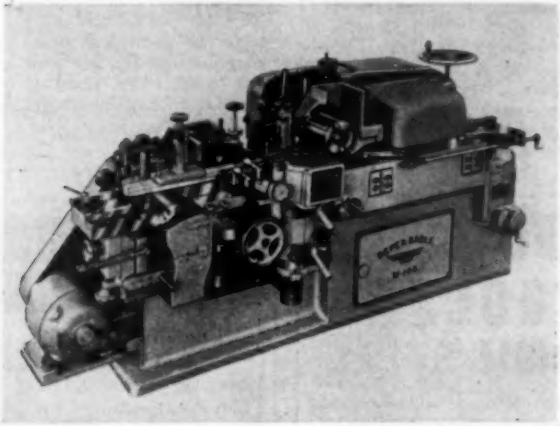
# Equipment and Supplies for the WOOD WORKING INDUSTRY

## DEPENDABLE INTRODUCES ELECTRO-UNIT DRIVE MOULDER



The Dependable Machine Company has anounced a new, compact production line electro-unit drive moulder, in 4, 6 and 8 inch sizes, with a removable cartridge-type spindle unit. With feed set at 150 f.p.m., the heads with 6 knives each rotate at 5000 r.p.m. to make 17 knife marks per inch.

A new feature is the cartridge-type head unit, which operates with any standard 1-13/16" head. The entire spindle bearing housing can be quickly removed. Each head's knives can be set, ground and pre-jointed in its own bearing housing. Heads adjust vertically and horizontally.

Spindle units are made of heat treated and hardened alloy steel, and contain two double rows of permanently lubricated, pre-loaded, precision ball bearings. The turret-type side cartridge units and the top and bottom cartridge units are interchangeable. With extra cartridge units, heads can be pre-set and jointed for anticipated work, and a change in setup can be made in a few minutes.

Chip breakers and safety hoods pivot away from heads, or are quickly removed. Top and bottom heads are equipped with sectional chip breakers for easy replacement and adjustment.

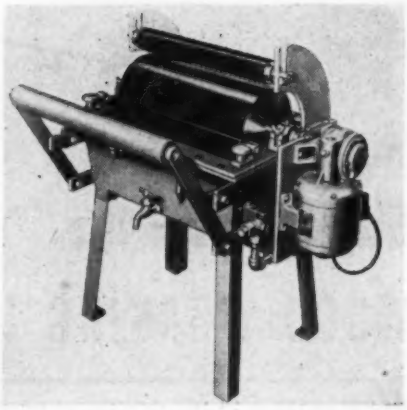
Feed rate is infinitely variable from 16 to 150 f.p.m. Feed drive is by preloaded Diamond chain and hardened steel sprockets. Feed has instantaneous reversing switch that operates independently of spindles, guides or holddown. The feed adjusts by handwheel, from 0 to 4 inches for stock thickness, and the top feed rolls has a spring yield of 1½ inches.

For additional information write the Company, Dept. WD, Greensboro, N.C.

### DUAL PURPOSE GLUE SPREADER

Union Tool Corp., Warsaw, Indiana, designer and manufacturer of wood gluing equipment, is now producing accessory equipment for use in conjunction with its No. 10 edge glue spreader.

These new accessories include a holddown roll with cradle-type supports for use in surface gluing and an infeed support roll for use in surface or edge gluing of long stock. The spreader is equipped with ¼ h.p., 110-v., A.C., 60-



cycle motor. It is particularly adapted for use with hot glues. The copper tank is jacketed and equipped with thermostats for use with steam or electric heat. The coating roll is 8⅜" in diameter, available in lengths of 12", 18" or 24".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**SWEDISH STEEL**

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**The tools woodcarvers have been looking for**

- Superior Quality
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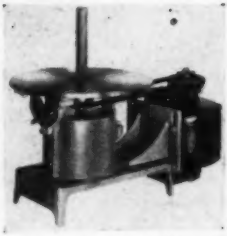
**LUX** OSCILLATING SPINDLE **SANDER**

**COMPLETE**



line of bench and floor models for pattern makers, furniture and woodworking shops. Spindles from ¼ to 5" dia. Two-way tilt table. Oscillating mechanism totally enclosed in bath of oil. Long-wearing, trouble-free performance.

**Write for prices**

**MINNEAPOLIS MACHINE & TOOL CO.**
1905 S. Washington Ave. Minneapolis 4, Minn.

## THE DRYALATOR

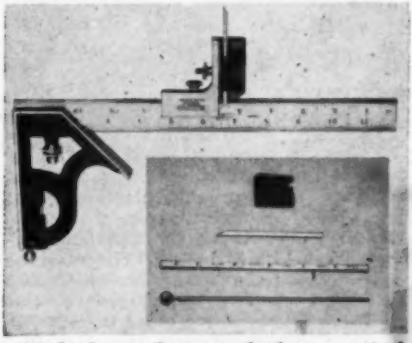
Lumber Dryalators, Inc. are presenting their new equipment to the trade, claiming that it takes only four days from the log to the finished lumber. By using the new process of dehydration, only a small fraction of the time and space is necessary, they say, to produce dry lumber.

The Dryalator is a self-contained, high speed drier, consisting of the fan, motor, coils, etc., engineered and assembled into a compact automatic unit. The unit is said to work well in a small inexpensive frame or cinder block kiln. Started with a pushbutton, it shuts off automatically when the lumber is dehydrated to a predetermined moisture content and has a safety shut-off in case of power failure. The heat is provided from a plant's present boiler or a boiler automatically fired with oil or wood waste.

Further information about the equipment available from Lumber Dryalators, Inc., 31 Milk St., Boston, Mass.

## CONVERT SQUARE INTO GAUGE

The utility of any 9", 12", 18" or 24" Starrett combination square can be further extended by means of a set of attachments developed by the L. S. Starrett Co., Athol, Mass. The new set No. 289-C, consists of a clamp block, scriber, 6" rule and 6" rod.



With the scriber attached, a practical height gauge results which can be used to measure or mark off vertical dis-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24" x 48"
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30" x 60"

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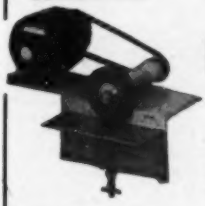
The new, economical
**ECONAWAY ABRASIVE BELT SPLICER**



Precision built.
Will splice any size and any kind of abrasive belts, and sleeves, straight and true. Save money and time. Write for particulars, stating the belt and sleeve sizes you use.

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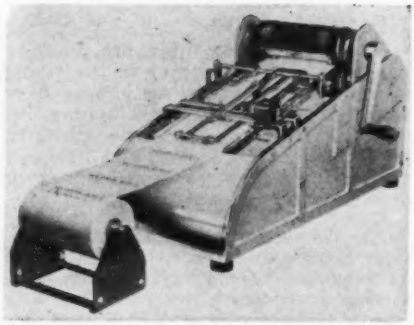
tances from a plane surface, for locating depths of holes, slots, recesses, etc., in 64ths of an inch. With the rod, also used as a depth gauge, the depths of smaller recesses, steps in holes, etc., can be similarly checked.

These new attachments are described and illustrated in a catalog offered by the manufacturer.



## NEW TAG & LABEL ADDRESSING MACHINE

Every firm shipping in quantities, or turning out production on government contracts that present a marking problem, may be able to use a Tag-O-Graph, Model K, tag and label addressing or marking machine. The machine reproduces from a stencil which can be prepared on a typewriter, or can be hand written or hand lettered with a stylus furnished with the unit. The long life stencil will carry nine lines of copy, and give 1000 or more clear, sharp and legible reproductions. Special processed ink insures waterproof and fadeproof permanent impressions. Stencil change is made in a matter of seconds.

Tags or labels are fed through the machine automatically at a speed of 150 per minute, an automatic counting device tabulates the exact number required. Feed mechanism helps insure uniform and positive registration, each tag and label bearing identical imprint.

Carter
CUTS COSTS WAY DOWN!
CARTER RIGID WHEELS & TIRES
Carter rigid Wheels and 30" & 36" Quick-Change Tires are for heavy-duty high-speed operations. Tires won't throw even at 1800 r.p.m. Changed in 10 min. 20 years service on best machines. Carter products universally accepted as standard equipment by leading bandsaw manufacturers.
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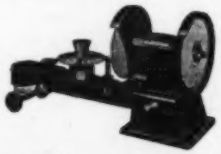
rip, cut-off, combination saws, and dados (5" to 30"). Accurately sharpens PTI Cut Control Saws!



Produces top quality results in fraction of time usually necessary for sharpening, jointing, gumming and tooth forming. Any hook or pitch of teeth and depth of cut is quickly adjusted. Both hands are free to control position of saw while grinding.

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PROVIDENCE SAW & KNIFE CO.
Dept. WD 303 Eddy St. Providence 3, R.I.

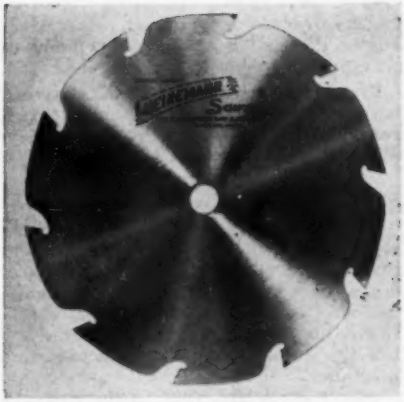
Movable printing drum permits operator to register on any portion of tags or labels, and simple adjustments permit quick changes for tags and labels of various sizes. Same machine handles tags or labels. Sturdy construction and precision engineering insures many years of trouble free service. Weight is 22 lbs., overall size is 9"x20"x11".

Manufactured by Weber Addressing Machine Co., Mt. Prospect, Illinois.

## MICRO-CUT SAW

The Micro-Cut saw, a new safety circular saw, was recently introduced by the F. Heinemann Saw & Mfg. Co., Canton, Ohio.

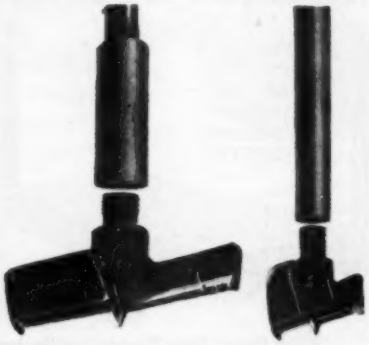
The new saw is claimed by the manufacturer to be a decided improvement over any similar type saw due to the style of tooth, which eliminates the need for expensive sharpening equipment and permits easy resharpening by hand. The cutting edge of the tooth is designed with a definite pattern which is easy to follow. As the stock is filed back on the cutting edge in resharpening, a convenient gullet, which offsets the cutting edge, can also be moved back—thus the original tooth pattern can be maintained after several sharpenings.



The new Micro-Cut saw is designed


**PLANETOR CHIP FLOW MACHINE BITS**

**Supreme in smoothness, speed, endurance**



STOCK SIZES: 1" to 4" by 16ths. 4⅛" to 6" by 8ths on special order.

*Dealers in Principal Cities*

**PRICE & RUTZEBECK**

BOX 30 HAYWARD, CALIF.



**HERE IT IS!**

**A Dependable, Inexpensive Addition to Your Material Handling Equipment.**

**LIFT TRUCK JACK & PLATFORM**

The lowest price combination available in semi-mobile factory or shop handling equipment. You can't beat it for semi-heavy work or convenience. Equipped with steel or rubber wheels.

**Write for Complete Literature**

**GLOBE VISE & TRUCK CO.**

283-87 Front Ave. N.W.
Grand Rapids 4, Michigan

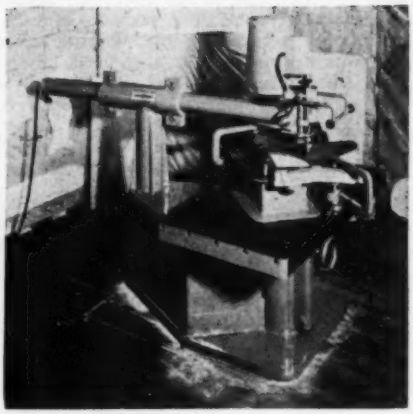
for greater safety, reduced power cost, longer life and maximum efficiency in all types of lumber and plywood sawing.

The saw is available with all standard bore sizes in six, seven, eight, ten, twelve, fourteen, and sixteen inch diameters.

### SWISS ROUTER-SHAPER

The Woodworking Precision Machinery and Tool Co., Inc., has brought from Switzerland the Kora radial arm router and shaper to this country. It is manufactured by Albert Koberle Ltd. specifically for the woodworking trade and is a fine example of the Swiss precision machinery.

Using the Koberle specially designed carbide tools, three jobs can be accomplished simultaneously with the Kora. Three stage tool permits straight cutting over the whole piece, shaping or rounding, and grooving. The head can be moved at a rate of 30 f.p.m. These features present advantages to manufacturers of odd shaped pieces, chair legs and almost any job where several operations can advantageously be reduced to one.



The Kora has a six foot radial arm along whose top and bottom specially ground and hardened steel rails have been mounted. These rails permit easy movement without play over four sets

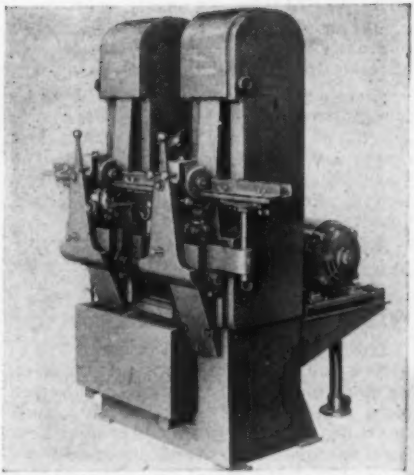
Hamilton
FACTORY TRUCKS
ESPECIALLY DESIGNED FOR THE WOOD-WORKING INDUSTRY
NO. 800
Cap. 1500 lbs.
Heavy Duty Wheels and Casters
Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.
Write for descriptive circular and low prices.
THE HAMILTON CASTER & MFG. CO.
1800 Dixie Highway Hamilton, Ohio

of roller bearings. The machine comes equipped with a standard table 5 feet by 2 feet 8 inches. On this table there is a special holder which is adjustable for use with a small or a large piece; and two ball bearing clamps which can be swung aside as the cutting head approaches without loosening or removing the clamp.

Information and literature on the Kora may be obtained by writing to The Woodworking Precision Machinery and Tool Co., Inc., Dept. WD, 224 Fifth Avenue, New York City. The machine will be exhibited at the Forest Products Research Society show at Philadelphia, May 7-13.

## SANDING AND FINISHING MACHINE

Production Machine Company will for the first time display their No. 484 duplex sanding and finishing machine sanding dowel stock upward of 120 f.p.m. at the Forest Products Research Society Industry Show in Philadelphia, May



7-11. The machine is designed to polish and finish under continuous production loads. It is said to handle cylindrical work up to 1½" diameter and either straight or tapered, and will produce a

with exclusive all-around clearance cut . . . will not chip the work at the fastest feed . . . give you high speed, top quality door production with operating economies you'll appreciate!

ECONOMIES ARE BUILT-IN! Shimer circular bits, for example, outwear conventional straight-type bits many times . . . give you 3" to 5" of available cutting edge and are easy, quick to sharpen with the convenient gauge supplied! Also . . . expansion feature gives you wider or narrower panel groove as required!

also . . . SHIMER EIGHT-BIT EXPANSION DOOR HEADS

WRITE FOR YOUR FREE COPY OF OUR ILLUSTRATED PATTERN BOOK!

SAMUEL J. SHIMER & SONS, Inc
85 RACE STREET • MILTON, PENNA.

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STAMPINGS

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The World's Largest Producer of Washers
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variety of finishes on nearly every type of material. Work may be fed either manually or by means of hoppers or other automatic feeding devices.

Specifications include: capacity subject to weight, $\frac{1}{8}$" to 1½" dia.; belt length, 4" x 84"; belt speed, 5000 s.f.m.; drive, uni-pull belt; motor, 3 h.p., 1800 r.p.m.; floor space, 33" x 40"; overall height, 59"; net weight with motor, 1050 lb.

Details from the Company, Greenfield, Mass.

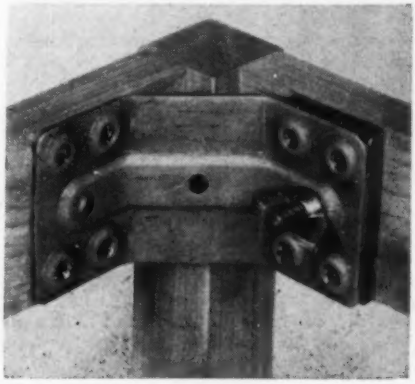
## PORTABLE POWER HACKSAW

The Tri-Saw Corporation has released a new folder and operating manual on its portable power hacksaw. Publicized as a tool of 1001 uses that cuts most anything anywhere, the improved Tri-Saw features one-shot lubrication, replaceable high speed bearings and a complete line of specially engineered blades for every type of cutting.

Free literature from Tri-Saw Corp., 6611 Clayton Rd., St. Louis 17, Mo.

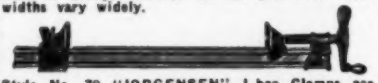
## BED RAIL CONNECTOR

La Vern E. Rudolph and Associates advise us that they are now producing a bed rail connector known as Corner Lock. It is especially designed to meet the following qualifications: no specially machinery required—a one or two spindle boring machine will do it; permits use of narrow side rails, reducing lumber cost; prevents side rail




"Jorgensen" TRADE MARK REG U S PAT OFF PILING CLAMPS

Style No. 2100 "JORGENSEN", for the most economical and convenient method to increase your edge-gluing capacity. More glued stock per pile—work clamped on both sides prevents buckling—all clamping done on same side of pile—any thickness of stock, any length, width, or height of pile without special fixtures or trucks. The work is always centered on the pile even when widths vary widely.



Style No. 70 "JORGENSEN" I-bar Clamps are a long-time favorite; the Multiple Disc Clutch zips to position, holds securely, releases easily without notches or other deformity in the bar. Carefully designed and manufactured for longest service—at no extra cost to you.

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ADJUSTABLE CLAMP CO.

*"The Clamp Folks"*

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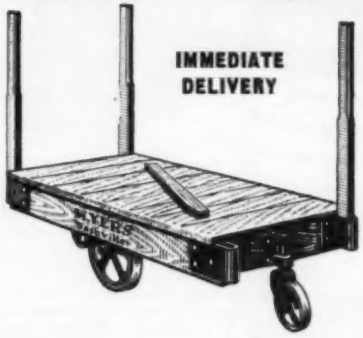
MYERS "TOUGH BUILT" TRUCKS




Capacities: 1500 to 5000 lbs.
Platform Sizes: 21 x 42" to 36 x 72"

Catalog and Prices upon Request

MYERS TRUCK & CASTER CO.

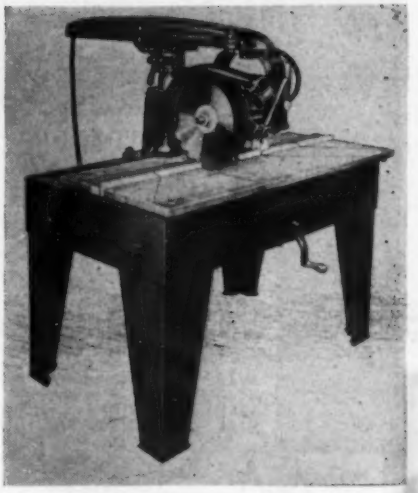
914 Trinity Lane . . . Nashville 7, Tenn.

from twisting; retains more wood in both post and side rail and is said to assure a very tight joint at the rail and post. Too much sanding, moisture change or finish application will not affect the joint, it is claimed.

The hardware is available to all furniture manufacturers from the Company, 283 W. 16th St., Holland, Mich.

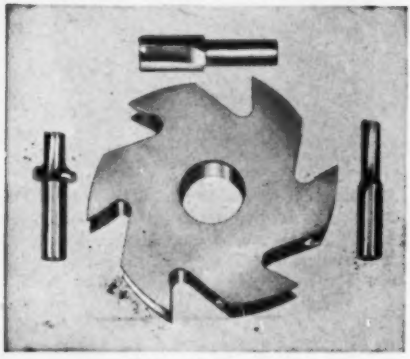
### RADIAL ARM SAW

DeWalt Inc., manufacturer of cutting machines for the woodworking industry, is introducing a new radial arm saw. The new machine is a receding arm saw that is called the DeWalt R-2. The motor is the DeWalt-manufactured low dead-rise motor. The DeWalt low dead-rise, direct-drive motor is said to permit a depth of cut that is about 40% greater than that possible with conventional designed direct-drive motors. The reduced interference of the bottom of the motors permits the arbor to be brought closer to the material being cut. The DeWalt low dead-rise, direct-drive motor of the Model R-2



is wound with Formex Fiberglas insulation, and provided with grease-seal-for-life bearings that require no lubrication. A.C. motors of this model are totally


**Sterling Quality**
**Woodworking TOOLS**



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**Shaper Cutters - Sash Cutters**

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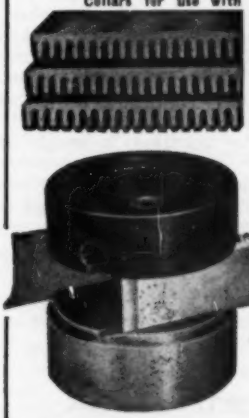
728 Sixth Street Rockford, Illinois



**KNOUREK (PATENT) BALL BEARING SHAPER COLLARS**

Knourek Patent Ball Bearing Shaper Collars for use with plain beveled edge shaper steel or Lock Edge Shaper Steel. Ask for circular covering Knourek Ball Bearing Shaper Collars and Schmidt Lock Edge Collars. This combination prevents accidents on shaper and knives cannot become loose and fly out of collars.



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CUT COSTS, make stronger assemblies with QUALITY CONTROLLED "ROCKFORD-PHILLIPS" or SLOTTED HEAD WOOD SCREWS.
Stock of all sizes and head styles ready for shipment.
FOR COMPLETE INFORMATION AND PRICE LISTS WRITE FOR OUR NEW WOOD SCREW Catalogs No. 202 and No. 106.
We fabricate a complete line of STANDARD • AUTOMOTIVE • AIRCRAFT & SPECIAL Threaded Fasteners.
"Quality Controlled Products"
"ROCKFORD" Screw Products Co.
2501 S. Ninth Street
ROCKFORD, ILLINOIS
Phone: 4-9441 or Wire: RK 88

enclosed to prevent explosions, and Universal A.C./D.C. motors used on this model machine feature a protected enclosure.

The arm of the DeWalt Model R-2 rides smoothly on eight grease-packed, double-row bearings. Locating latches permit the rapid location of the cutting tool in any of many cutting positions. DeWalt Model R-2 motors have thermal overload and manual push button starting switch. The machine is available in 3 and 5 H.P. sizes, and the recommended saw blade sizes are: 12 inches for the smaller models, and 14 inches for the larger models.

For additional information on the DeWalt Model R-2 receding arm machine, write to DeWalt Inc., Department P-174, Lancaster, Pennsylvania, for free literature.

## NEW TAG MOISTURE METER

An all-purpose meter for measuring the moisture content of lumber, wood and other materials of varying textures and consistencies has been introduced by the Tagliabue Instruments Division of Weston Eleectrical Instrument Corporation.

Known as the Moisturonic meter Model 8008, the portable instrument features an overall range of from 2,000 ohms to 20,000 meg-ohms. The instrument can be used with any material capable of accommodating electrode probes.

Operating on the resistance principle, the Moisturonic gives accurate, instant moisture readings directly on wide, clear "double-range" scales. The instrument is available in two forms: one with a scale calibrated for use with lumber, wood, plaster and wood products, the other with linear graduations for use with materials for which no calibrations have been determined.

Complete details on the new Tag Moisturonic meter can be obtained from Tagliabue Instruments Division, Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.

## PLIER-TYPE TOGGLE CLAMP

A light, compact new portable plier-type toggle clamp, "De-Sta-Co" No. 424, is announced by Detroit Stamping Company. The new fast-acting clamp is particularly suitable for aircraft assembly, sheet metal and body work, and

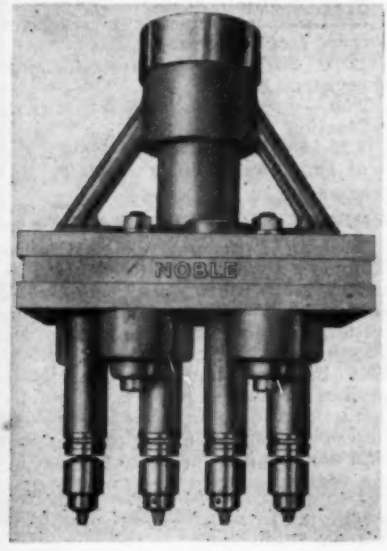
for holding metal, wood or plastic parts during machining, welding and cementing operations. Provides positive holding pressure with a firm toggle locking action. Light weight, only 5 oz., makes it ideal for one-hand use, while compactness (overall length 4½") allows use in restricted working area. Handles and jaws are forged high-alloy steel, bearing pins long-wearing stainless steel.

Descriptive bulletin available from Detroit Stamping Company, 312 Midland Ave., Detroit 3, Michigan.

## MULTI-SPINDLE HEAD ADJUSTS FOR PATTERN WORK

The four spindles shown on this new type head are assembled in pairs on the sides of two driving gears in the head. They ride in slots for lateral adjustment. A second adjustment, independent of the first one, is possible by swinging the spindles on their slot-mounted centers. The setup can be located in either the straight line of a desired pattern position.

Capacity, 7/16". Straight line adjustment is minimum between adjacent




spindles at 1¼" and maximum between the two outside spindles at 9¼". Radial adjustment is minimum at 1⅞" and maximum at 7". The maximum rectangle is 5½" by 8½". Maximum diagonal distance between the outside spindles is 10½".

Complete information from Noble Machine Tool Co., 195 Weeden St., Pawtucket, R. I.

---

Sympathy is never wasted except when you give it to yourself.

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ADHESIVE
STIX
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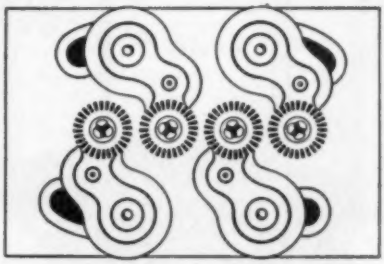

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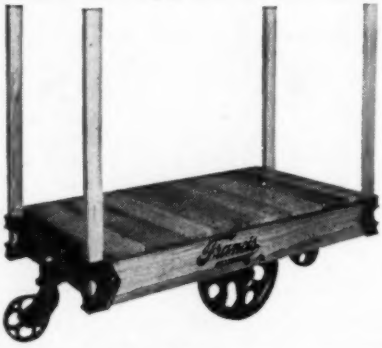


**Complete Line —**
For every use. Standard sizes 27" x 48" and 30" x 54" in stock ready for immediate shipment.

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DEPT. F 1701 E. 38th St., Indianapolis, Ind


### SASH & DOOR JOBBERS PLAN MEETING

The tentative schedule of activities for the Annual Membership Meeting of Southern Sash & Door Jobbers Assn. follows:

**Sunday, June 3—5:00 P.M.—6:30 P.M. —SS & DJ Assn. Membership Committee Meeting**

**Monday, June 4—9:30 A.M.—12:30 P.M. —SS & DJ Assn. Board of Directors Meeting**
12:30—2:30 P.M.—Luncheon for entire registration.
2:30—3:30 P.M.—General Meeting for entire registration a speaker from OPA and a speaker from NPA.
3:30—4:30 P.M.—SS & DJ Assn. Annual Membership Meeting (Members only) Report from members of conditions affecting the Industry. Annual Activities Report of Sec-Treas.
5:30—8:00 P.M.—Cocktail and Buffet Supper Party—entire registration.

**Tuesday, June 5—8:00—10:00 A.M. —AWWI Board of Directors Meeting and Breakfast.**
10:30 A.M.—12:30 P.M.—New Board of Directors Meeting of Southern Sash & Door Jobbers Assn.
12:30—2:30 P.M.—Luncheon for entire registration
2:30 — 4:30 — P.M.—AWWI Annual Meeting
4:30—6:00 P.M.—AWWI New Board of Directors Meeting

### ROTARY WORK FEED TABLE

Bulletin T-80 presents the Bellows Company rotary work feed table. This rotary table feeds work pieces to and under drill press spindles, milling cutters,, arbor and impact press rams, riveting heads, etc. quickly and safely. The bulletin shows installation, describes in detail all parts of the feed table, includes dimensional drawings and specification data, wiring diagrams and electrical hook-ups.

For a copy write the Bellows Company, Dept. WD, 222 W. Market St., Akron, Ohio.

**IMPROVED Ball Bearing Shaper Collars**

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

**GUSTAFSON & SCOTT MFG. CO.**
1637 Lowell Avenue Chicago 39, Illinois

**High Speed HANGER BOLT DRIVING . . .**

**A NEW, FAST OPERATION TIMED IN SECONDS!**

This tool is used by a majority of plants where hanger belt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger belt. (It is not necessary to stop rotation at any time.)

- AUTOMATIC TAKE-UP FOR WEAR ON JAWS
- REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
- AFFORDS ACCURATE PROJECTION HEIGHTS
- USE WITH ANY AIR OR ELECTRIC DRILL OR DRILL PRESS

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*Production Tools*
**49 Main St. FAIRVIEW, PA.**

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**ELECTRIC GLUE POTS**
*Thermostat control*

**WATER JACKET TYPE**
Heavy cast aluminum with attached bowl.
110-120 VOLTS or 220-230 VOLTS AC or DC.
One pint. One quart. Two quarts. Four quarts.

**DRY TYPE**
Heavy sheet iron body
Porcelain enamel glue container
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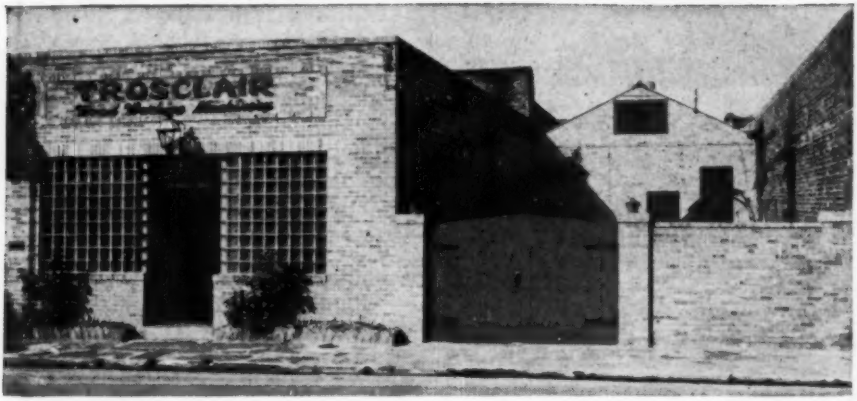
**Style No. 5, with loose or fixed handle**
Fast acting, general purpose clamp with Hartford rapid-action tail piece for quick adjustment to work.

**HARTFORD CLAMP COMPANY • EAST HARTFORD, CONN.**

## TROSCLAIR EXPANDS SERVICES




Trosclair Wood Working Machinery of New Orleans announces that they are now handling Solem machines. The Company already represents: Bell, Diehl, Hermance, Mereen-Johnson, C. O. Porter, Root, Tannewitz, Taylor, Vonnegust and Whitney in the "deep south" area.

Of special interest is Mr. Trosclair's experience in advising on dimension stock and waste lumber products. He tells us that the Company has been able to help wood products manufacturers develop salable items for offal, slaps, etc. formerly burned in refuse burners or slab pits. Among the items manufactured from such residue are: dimensioned stock for furniture, toys, games, novelties, pallets, boxes, handles, and innumerable products.

If you are located in this area and wish advice about streamlining your present setup, or acquiring new machines, write to Trosclair Wood Working Machinery, Dept. WD, 319 N. Diamond St., New Orleans 13, La.

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**DUSTKOPS** **20 Models**
UNIT TYPE 300 to 3600 cfm
LOW COST ¼ hp to 5 hp

*AVAILABLE FROM STOCK*

For: Grinders, buffers, polishers, woodworking, lint . . . All Dusts.

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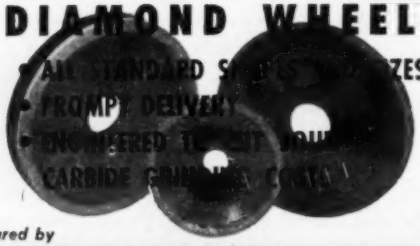
• ALL STANDARD SHAPES & SIZES
• PROMPT DELIVERY
• ENGINEERED TO FIT YOUR
CARBIDE GRINDING COSTS



*Write for catalog and name of distributor nearest you*

*Manufactured by*

**UNITED STATES DIAMOND WHEEL CO.** AURORA ILLINOIS

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*Industrial Engineers*
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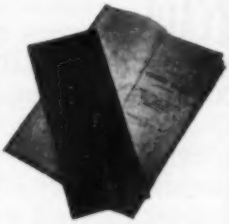
**For Manufacturers, Dealers —Anyone Who Works With VENEER, PLYWOOD, CUT LUMBER, BOXES, Etc.**



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*Burton Saw Co.*
WORCESTER 8, MASS.

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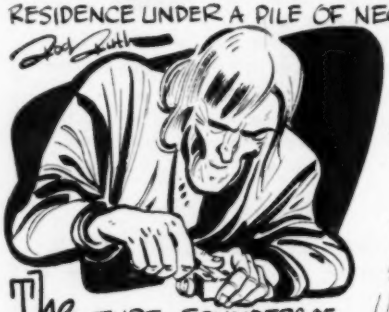
- BAND RESAWS "that cut straight"
- NARROW BANDS "that last longer"

**Give Your Band Saw Operator A Treat**

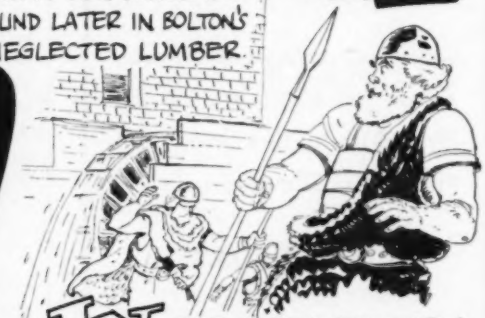
From 2000 miles away, a well-known millman telephoned this request: Would we recondition his older saws, which were of another make, to "cut as well as the new ones" we had just made for him.

# Mechanics Through The Ages

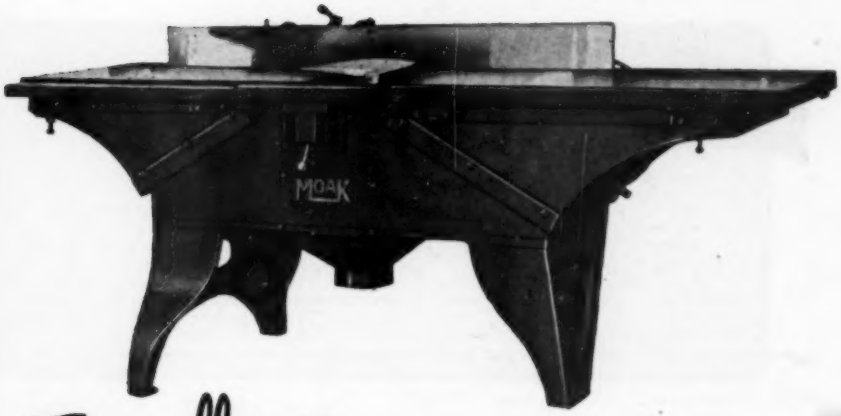
YEARS BEFORE THE TIME OF THE DEGUERRO-TYPE, JAMES WATT AND HIS PARTNER, MATTHEW BOLTON OF SOHO, ENGLAND, EXPERIMENTED WITH THE ACTION OF LIGHT ON NITRATE OF SILVER. INDEED A SILVERED COPPER-PLATE, CARRYING A SUN-IMAGE OF BOLTON'S SOHO PREMISES, WAS FOUND LATER IN BOLTON'S RESIDENCE UNDER A PILE OF NEGLECTED LUMBER.



The TYPE FOUNDERS OF THE 1600'S USED GRINDSTONES TO REMOVE THE RAGGED EDGE OF EXCESS METAL LEFT AFTER TYPE LEFT THE MOULD. THEY COULDN'T USE THE GRINDSTONE, HOWEVER, ON "F's" AND OLD-FASHIONED "S's." THESE HAD TO BE LABORIOUSLY HAND-TRIMMED WITH THE SCRAPING KNIFE.



IN THE FIFTH CENTURY, THE INTRICATE WATER-OPERATED FLOUR MILLS DEVELOPED BY THE ANCIENT ROMANS STRUCK AWE INTO THE HEARTS OF RUDE GERMANIC INVADERS. THE THUNDEROUS CLATTER OF MILL STONES AND THE WATER WHEELS REMINDED THESE BARBARIANS OF THEIR THUNDER GOD, THOR-DENAR; AT FIRST THEY LET MACHINERY RUST RATHER THAN ATTEMPT TO OPERATE THE MILLS.

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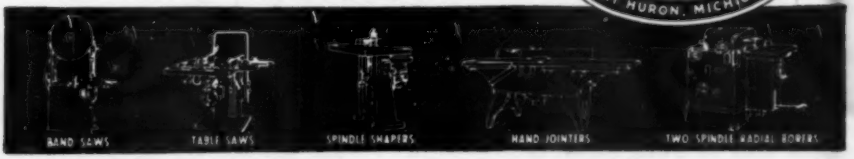
***Get the facts*** **on Moak Hand Planers and Jointers right away. Write for our illustrated descriptive and specification folder.**

MOAK MACHINE & TOOL CO.
MOAK
PORT HURON, MICHIGAN



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PARKS Universal Woodworking machine
SMITH, No. 505-B 43-inch 3-drum endless bed sander; fully electric.
ROGERS 66/R 66½" motor driven knife grinder.
HERMANCE No. 60 6-inch b.b. motorized moulder. Completely equipped.
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YATES-AMERICAN A-20 15" planer and matcher, complete with motor.

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Band saws, Amer. B-36 36" bb. dmd
Band saws, New Moak 36" bb. dmd.
Borer, Amer. 2 spindle radial dmd.
Borer, Root 2 spindle horiz. dmd. style "K"
Boring & sawing, McKnight 26F dmd.
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Dovetailers, Dodds, 10 & 20 spindle
Dowel Driver & Gluer, Bell No. 8 dmd.
Glue Jointer, Jenkins No. 343A bb. dmd.
Glue jointer, F & E bb. dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Moulder, Amer. 8" sq. hds. pb. bd. & motor
Moulder, Newman No. 20—8" sq. hds. pb. bd.
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Planers, New Crescent 24" bb. dmd.
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type Hvy., duty, electric
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 138—Belt, hand, pb. & motor
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed, bd. with motors
Sanders, F & E 60" 3 drum roll feed, dmd.
Sander, Mattison No. 172 edge belt bb. dmd
Sander, B & M 14 flat sander & motor
Sander, 48" double disc, dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Sanders, Yates-Amer. No. 413—2 drums 49" endless dmd.
Saws, Beach cutoff bb. dmd.
Saws, Powers, gang rip. pb. v-belt & motor
Saws, Buss Tilt table Variety bb. dmd.
Saws, Mattison 207 bb. dmd.
Saws, Yates G5 gang rip, pb. bd.
Shaper, Sherril Sgl. Spdle. bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Taping machines, Dennis No. 2
Tenon Heads, single & double end.
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & motor
Tenoner, F&E Sgl. with copes and motor pb. bd.
Veneer Jointers, Jenkins Saw—6 ft. bd.
Woodworker, Crescent pb. bd.
Many other items, send your inquiries.

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### 220 S. Jefferson St. Chicago 6, Ill.

Boring machines, single vertical motor driven
Chain Mortiser, electric hydraulic feed, new $1177.00
Chucking machines
End clamps, Handy, jaw 3½" high
Hand Hole Machines
Jointers, 4"—6"—12"—24"
Lock corner machines
Mortiser, heavy, Greenlee, for timbers 18"x20"—2¼" and 3" square chisels with boring attachment
Planer, Whitney 30" double, with new ball bearing in top and bottom heads, sectional double infeed rolls, flexible chip breakers, motor driven, Vee belt drive
Planer, American No. 444, 30", motor driven, ball bearing, round head, sectional feed and chip breaker, grinding attachment
Planers, Belsaw 12", ball bearing
Relishers, Door and Sash
Rip Saws, self feed and gang, new
Routers, portable, floor type and stair
Sander, Mattison No. 427, hand block
Sander, Wysong and Miles, 26" disc and spindle, motor drive
Sanders, pneumatic and brush
Saw franking machine
Saw, chain feed rip, Defiance
Saw, cut-off, double end, Chgo. No. 12
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Saws, scroll, ceiling and self contained
Saws, swing, self contained
Saws, radial arm
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Glue Jointer, American b.d.
Lock Corner Machine, dbl. Morgan
Mortiser, Chain, New Britain No. 2, b.d.
Nailer, Morgan 6-18", closed back
Planer, sgl. Amer. No. 444-30", b.d., dmd.
Planer, sgl. Berlin No. 153-30" b.d.
Planer, sgl. Buss No. 4, 26", d.m.d.
Planer, dbl. Yates No. 177, 30"x12", b.d.
Planer-Matcher, Woods 14"x6", 40 HP.
Radial Arm Saw, 5 HP DeWalt 3/60/220
Ripsaw, Amer. No. 15, St. Line, d.m.d.
Ripsaw, Mattison No. 297, b.b. electric
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Stock h.s.s. knives and resaw blades

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**Moulders, sanders, self-feed rip saws, band ripsaws, routers, glue jointers, saw tables, planers, and many other items of new and used machinery.**

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Band saw, 36" Crescent ball bearing Carter disc wheels, 3 HP direct motor drive
Borer, Valley City No. 2 two-spl. hor. m.d.
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Grinder, Dependable Mch. Co., Cutter, M.D.
Lathe, 30" Imperial Auto. Turning, M.D.
Planer, 24" H & B double, adjustable bed, M.D.
Sander, 43" Yates No. 401 3-dr. roll feed
Sawing, boring and chucking machine, Bell No. 24 Auto. double end.
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Band saw, Sidney, 32 in., $185
Borer, Andrews, 20 in., 6 spdle., vertical, $350
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Glue jointer, Yates, 213 B.B., $550
Miter Mch., Fox, foot power, $75
Mortiser, New light HC, $100
Moulder, Yates, C-4-A, 8 in., 4 side
Ripsaw, BB, Gang, $350
Sander, Perry, 36 in. 2 drum, $450
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**All machines rebuilt and fully guaranteed.**

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S. A. Woods 12", 15" four-side moulders.
Oscillating bit mortiser, DMD.
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**WANTED**
No. 315 top and bottom drum single sander
Band resaw.
Printer, 14" drums.

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50,000—Fir Plywood Discs—19½" Dia. x ¾" Thick
100,000—Fir Plywood Pieces—8¾" x 9½" x ⅜" Thick
50,000—Wood Wheels 2½" Dia. x 7/16" hole thickness from ¼" x ⅞"

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Lathe Mattison 42" either plain or ball bearing, both motor driven, ball bearing machine with chucks.
Nash 6 spindle turning sander, will take stock up to more than 50" long, mtr. dr.
Sander, endless bed, Smith 42" 3 drum, motor driven, plain bearings.

**VICTOR J. REED**
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Bell Dowel Machine No. 50A. ¼" to 2", 10 HP, used less than 4 months. Tooling for ⅝", ⅞", 1", 1-5/16", 1⅝" Dowels included.

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Motor Driven Dado Saw
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NEW KORNAU HOLLOW CHISEL MORTISER
NEW 12" B.B. TILTING ARBOR SAW
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Berlin Invincible Roll Feed 49"—3 Drum Sander "V" Belted Individual Motors.
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YATES C 4 8" Four Side Moulder Slip on Hds.
YATES C 3 4" Four Side Moulder Slip on Hds.
YATES 185 30" Dbl. Surf. 6 K Ro Hds.
AM 80 30" Dbl. Surfacer 6 K Ro Hds.
YATES 108 15" Four Side Moulder
YATES 108 10" Four Side Moulder
YATES 431 30" 3-Drum End. Bed Sander
NASH 22 10 Spdl. Turning Sander
MATTISON 57D 42" Auto. Turn. Lathe
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CHATTANOOGA Ball Br. Gang Ripsaw
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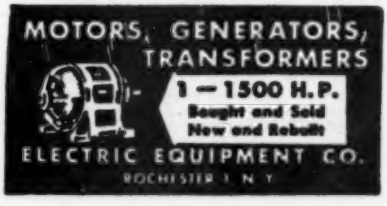

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16" MATTISON 228 Moulder with 20 HP top, 15 HP bottom, 7½ HP sides, 8 HP four-speed feed jointing bars. 5'x20" feed table. With heads. Excellent used machine.

36" YATES-AMERICAN No. 1 Jointer, ball bearing, four knife round head with guaranteed 10 HP, 3600 rpm, 220/440. Serial No. B10547. Would make excellent facer.

Glue Jointer and Edge Moulder, YATES-AMERICAN No. 213, with two 5 HP, 3600 rpm, ball bearing cutter motors and vise grip heads. 1½ HP, 1800 rpm feed motor. Feed speeds 20/40/55/75 f/m. Jointer bar.

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Two St. Joe. Southern Special Staplers, Chain Feed Type. Like new. Can be seen in operation.

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Planer, 30"x16" Orten, D.M.D., B.B. Endless Bed.
Planer, 24"x8" F. & E., Mod. No. 156 D.M.D., B.B.
Shaper, Double Sp., Buss, D.M.D., with freq chgr.
Shaper, Single Sp., Porter, Belt drive.
Jointer, 12" Yates, 5 H.P., D.M.D., B.B.
Jointer, 16" Porter Mod. 300, D.M.D.
Band Saw, 36" Tannewitz, Type G.H., D.M.D.
Band Saw, 36" Yates Amer. Mod. Y36, D.M.D.
Band Saw, 30" Oliver, Type S.C., D.M.D. E
Table Saw, 16" Oliver Mod. No. 270, D.M.D.
Table Saw, 16" Whitney, Mod. No. 77, D.M.D.
DeWalt, 32" Radial Arm Saw, 10 H. P. E.

Largest stock of woodworking machinery on the Pacific Coast.

**HICKS MACHINERY & MFG. CO.**
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Bandsaws, moulders, rip and cut off saws, planers, jointer, chain mortiser, tenoner, scarfer, scraping machine, compressor, shapers, spot welder, grinders, routers, facing surfacer, belt sander, exhaust fans, many hand electric tools & misc. equipment. All in good operating condition. Many nearly new.

*Send for complete list and prices.*

**R. J. HAFNER CORPORATION**
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Large woodworking factory in Pennsylvania wants capable man to run shop. Estimating, read prints for all types wood assemblies. Permanent position, good salary. Give details in letter.

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Nailing Machines and other Box Making and Woodworking Equipment.

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Sales Opportunity — selling to Veneer and Plywood Plants in Virginia, North & South Carolina with old established manufacturer. Salary and expenses. Also pension plan. Give references, past experience.

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**Address replies to:**
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Manufacturer of television cabinets and occasional furniture located Middle West has opening for all around Mill Room Supt. Man with proven ability. Excellent opportunity for man capable of handling big job; seeking permanent future. Give detailed resume first letter.

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Andrews 7 spindles 5' Vertical foot feed
Andrews 6 spindles 8' Horiz. foot feed
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Prybill—radial 1" to 12"
Single spindle horizontal

## DOVETAILERS

Dodds 10, 15, 20 spindle

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American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday L. Powers, HB Smith, Crescent Sidney

## MORTISERS

New Britain, No. 2, chain
New Britain, No. 7, chain
Northfield, chain mortiser, motor driven Hydraulic feed
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

## MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Yates American No. C55—18" all electric
SA Woods No. 107 12" 5 heads, belt driven
SA Woods No. 131 9", belt driven
American No. 20 7", belt driven

## PLANERS

Oliver 24" Single DMD BB sec. feed and chip breaker
American Saw Mill 24" single DMD BB
Northfield 24" single, MD motor fd. No. 5
American 24" single, belt drive
Buss 26" single, BB BD sec. feed and chip breaker, and MD grinder

## PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

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Peerless 9" 14" and 20" horizontal
Peerless 9" 14" Vertical
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Tannewitz 36" DMD 32" under guide
American No. 4 40" rip and resaw
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
Yates V40 48" BB Angle Bandsaw
Northfield BB & DMD 20" to 36"

## SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BB
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB
Beach multiple, cut off 6' DMD BB
Jenkins No. 105A double cut off and mitre saw, 96"x60" MD motor feed BB

## SAWS - RIP SAWS

Yates American G77 Str. Line DMD BB motor feed
Sinker Davis, self feed gang, BB belt dr.
Beach Self feed gang, DMD 15 HP BB

## SAWS - VARIETY

American No. 10 tilt top belt drive
BM Root tilt top belt drive
Mereen Johnson, double tilt arbor, DMD BB with carriage
American No. 8 tilt arbor DMD BB rolling table
50 other makes to choose from

## SHAPERS

L. Powers single BB - MD
Union Single spindle BB MMBD
Defiance Double spindle, DMD with tilting and sliding heads
Whitney 2 sp. automatic BB MD No. 105
Yates N2 BB MD

## TENONERS

Fay & Egan No. 70 Single end belt driven
American No. 1 Single end belt driven
Jenkins No. 90 dbl. end 66"x48" BB DMD
2 tilt cut off saws
4 tenone heads
4 scoring saws
2 cope heads
1 Jump dado
1 feed motor
14 motor machine

## MISCELLANEOUS

American dowel machine BB
Covel Hanchett Band Re-saw grinder MD
Greenlee & Amer. Door clamps, Sash clamps
Smith 24" facing planer, MD, BB power feed

**Endless canvas belts, large variety of lengths and widths, also sand belts for Skilsaw, Porter Cable and Vonnegut brush sanders. Accessories and supplies, tremendous lot both new and used. Also band and resaw blades.**

**WE PAY CASH FOR ENTIRE PLANTS OR INDIVIDUAL MACHINES**

**American Machinery & Motor Co., Inc.**
22 HOWARD ST., NEW YORK 13, N. Y.

# SUTTON GUARANTEED

## BORERS

Single Spindle Fay & Egan No. 1 Vert. Borer
Multiple Spindle Vertical Fay & Egan Borer
Root Vertical Hydraulic Gang Borer
Amer. No. 2½ Single Spin. Horiz. Boring Mach.

## CLAMPS

Practically New Taylor 40 Section Power Operated Clamp Carrier
Taylor 40 Section Air Operated Clamp Carrier
Handy No. 103 Frame Clamp
Automatic Edge Gluer with Taylor Panel Flow Glue Spreader
29 Section 6½' Power Operated Billstrom Clamp Carrier

## DOVETAILERS

Dodds 15-Spindle Dovetailer
Dodds 12-Spindle Dovetailer
Pair 12-Spindle Dodds Dovetailers equipped with motor driven Automatic Feed
Wysong & Miles No. 290 Auto. Dovetailing Mach.

## GLUE SPREADERS

Practically New Black Bros. 12" Motor Driven Edge Glue Spreader
New Union Conveyorized Edge Glue Spreader
Taylor Panel Flow Edge Glue Spreader

## GRINDING ROOM EQUIPMENT

American No. 9 Automatic Knife Grinder
New Hanchett Automatic Band Saw Grinder for 7" Blades

## JOINTERS

Yates-American No. 213 Direct Motor Driven Glue Jointer
12" direct motor driven ball bearing Hand Jointer

## LATHES

Mattison 42" No. 57-D motor drive ball bearing
Mattison 30" No. 55-C motor drive ball bearing
Large quantity Mattison Lathe Heads with carriers and knives

## MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
Greenlee No. 227 direct motor driven single spindle mortiser

## MOULDERS

Yates-American 4" Type C-69 Electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Mattison 6" No. 276 Electric Moulder
Yates 10" Type C-55 Electric Moulder
Practically New 12" Vonnegut Electric Moulder

## SINGLE PLANERS

New Crescent P-24 Direct Motor Dr. with Grinder
Used Crescent P-24 Direct Motor Driven
Whitney Ball Bearing Direct Motor Driven
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Herzog Feed

## DOUBLE PLANERS

Yates-American 30" No. 177 Ball Bearing Direct Motor Driven with electric Knife Grinder

## SANDERS

Solem 43" S-3M Motor Driven Ball Bearing Endless Bed Sander
Yates-American 43" No. 431 Direct Motor Driven Endless Bed Sander
Yates-American 61" S-23 Roll Feed Direct Motor Driven Ball Bearing Three Drum Sander
Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
Nash No. 10 Automatic Turning Sander
Oakley Semi-Automatic Stroke Sander

## BAND RESAWS

Yates No. 283 Roller Bearing Band Resaw
American No. 4 Band Resaw
Mershon Practically new 54" No. 54C Ball Bearing Motor Drive

## CUT-OFF SAWS

DeWalt Model GE 10 HP Practically New
Yates-American No. 51 Direct Motor Driven Swing Saw
Yates-American No. 2 Direct Motor Driven Ball Bearing Double Cut-Off Saw
Beach Direct Motor Driven Ball Bearing Double Cut-Off Saw

## RIP SAWS

Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
Yates-American G-7 Direct Motor Driven Ball Bearing Chain Feed Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw

## ROUTERS

Porter No. 600 Electric Router

## MITRE SAWS

Yates Type F-2 Direct Motor Driven Ball Bearing
Tannewitz Direct Motor Driven Tilting Table Variety Saw
Bell No. 12 Direct Motor Driven Ball Bearing Double Miter Saw

## SHAPERS

New Crescent Type S-2 Single Spindle Shaper
Whitney No. 139 Double Spindle Electric Shaper
Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 393 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper

## TENONERS

Fay & Egan No. 505 Direct Motor Driven Ball Bearing Single End

## VENEER MACHINERY

Francis 96" by 36" Hydraulic Veneer Press with 100 pairs of clamps and irons
Francis 76" Hydraulic Veneer Clipper
Dennis Veneer Taping Machine, Motor Driven
Diehl No. 60 Veneer Jointer Direct Motor Driven
Merritt 8 and 10 plate redriers 84" by 54"

## MISCELLANEOUS

GE 15 KW Motor Driven Frequency Changer
Leitelt Lumber Lift
Porter No. 3MB Pedestal Type Spindle Carver Motor Driven Ball Bearing

## SUTTON WOODWORKING MACHINE CO.

**Sedgefield Inn** **Phone 2-4186** **Greensboro, N. C.**

# REBUILT AND USED MACHINES

**BAND SAWS**
American B-36, 26"
Oliver No. 116, 35", D.M.D.
Jones-Superior No. 135, 42" M.D.

**BAND RESAW**
Fay & Egan No. 280, B.B., M.D., 54"

**BORERS**
Root "GM" Vertical Single Sp.
Greenlee No. 368 2-Spindle Horizontal M.D.

**CLAMPS**
Lancaster No. 400-B Air Frame Clamp
Lancaster No. 500 Air End Clamp

**CLAMP CARRIERS**
Taylor 6½ Ft. 12-Sec. Wheel Type

**DOVETAILER**
Dodds 10-Spindle, Spiral Gear

**FANS**
Sturtevant 50" single

**GLUERS**
Bell 72" Plate Edge Gluer

**JOINTERS**
6", 8", 12", 16", 20" sizes

**LATHES**
Mattison No. 57-D 42" Automatic
Reed 16" Turning Lathe, 16" swing

**MORTISERS**
Crescent Vert. M.D. Hollow Chisel
Wysong & Miles No. 181, 6-Spindle
American No. 10 Sash Mortiser & relisher

**MOULDERS**
Hermance 6" 4-Side
American 8" 4-Side
4" & 6" Single Hd. Stickers

**PLANERS**
24", 30" and 36" Single
Whitney No. 24, 36" Double, D.M.D.

**SANDERS**
Nash No. 65 Automatic Turning
Wysong & Miles 16" Disc Sander
Porter-Cable B-6 Irregular Belt
American No. 2, 43" Roll Feed, 3-Drum
Curtis No. 11 Semi-Auto. Belt Sander

**SAWS—CUT-OFF**
Porter Floor Type, with table
Y-A C-44 Floor Type, with table
Root No. 248 Double, 32"x82"
Bell No. 12 Double Miter

**SAWS—CHAIN FEED**
Mattison No. 205 and No. 207
American No. 15 Ball Berg., M.D.

**SAWS—SELF FEED**
Root and American
Hermance No. 31 Adjustable Roll
Greenlee No. 426—Yates No. 257

**SAW TABLES**
Tannewitz SJ Tilting Arbor
American Dbl. Revol. Arbor
American No. 7½ Comb. & Dado

**SHAPERS**
Whitney No. 8 Double Spindle
American No. 1 Single Reversible

**TENONERS**
Fay & Egan Single End
American & Smith Single End

**VENEER JOINTER**
Jenkins No. 23 D.M.D. Ball Berg.

## B. M. ROOT CO., YORK, PA.

# NEW & REBUILT WOODWORKING MACHINERY

### BORERS
McKnight No. 25-B, belt-drive
McKnight No. 26-F, motor-drive
Towsley, 2-spindle radial, motor-drive
Fay & Egan No. 310, 4-spindle, belt-drive

### CUTOFF SAWS
Porter A43-T compound mitre, motor drive
Fay & Egan No. 700, M.D.
Crescent Swing, B.D.
Towsley No. 2, M.D.

### JOINTERS
Porter 12", M.D.
Oliver, 20", B.B.—B.D.
Colladay, 16", B.D.
Rawley & Hermance 12", B.D.
New Moak 12 and 16-in., motor-drive

### MORTISERS
Greenlee No. 227 Hollow-Chisel, automatic, B.D.
American No. 20 Hollow Chisel, automatic, B.D.
Greenlee No. 228 Hollow Chisel, automatic, B.D.

### LATHES
Mattison No. 55-C, automatic, motor-drive
Mattison No. 55-F, automatic, motor-drive

### MOULDERS
New Dependable 6 & 8-in. M.D.
American No. 3, 6-in., B.D.
H. B. Smith No. 141-A, 3-side, B.D.
New XL 4 and 6-in. Moldmatcher, M.D.

### PLANERS
Buss No. 4L, model M, M.D.
Oliver No. 61, 24", B.D.
Fay & Egan No. 156, 36", B.B.—B.D.

### TENONERS
Greenlee No. 532, electric
New Powermatic and Crescent sgl.-end, M.D.
H. B. Smith single-end, B.D., with motors

### MISCELLANEOUS
Dodds 10" and 12" dovetailers
Curtis automatic rubbing machine,
Black Brothers No. 400 taper

**This is a partial list: write for quotations on specific machinery.**
**We buy — sell — or trade.**

## SUPREME WOODWORKING MACHINERY CO.
50-52 HOWARD STREET – NEW YORK 13, N. Y. – CAnal 6-3387

# AN EASY SOLUTION
## FOR YOUR MACHINERY PROBLEMS

**BAND RESAWS**
McDonough 54" Ballbearing, Dir. Mtr. Dr. (new)

**BAND SAWS**
Superior 42", ballbearing, motor driven

**BORERS**
Andrews 60" 6-Spindle, Horiz., DMD Power Feed
Valley City, 2-spdl., adj. radial, motor driven
American 2-spdl., adj., radial, motor driven
Superior 2 Spindle Adjustable Radial, BB, D.M.D.
Superior 3-Spdle., Adjust, Horiz. Motor Driven
Wysong & Miles No. 283B, Sgl. Spdl. Vert., B.B. D.M.D. (Like New)

**CARVING MACHINES**
Salstrom 24 Spindle, D.M.D., B.B

**CLAMPS—ASSEMBLY**
Bell Chair Assembly, Air Operated (like new)
Bell 4-way Hi-Jaw, Air Operated.
Bell 4-way Frame & Chair Back, Air Operated.
Bell No. 95, Revolving Case Clamp, Air Operated.
Handy No. 227, 4-way Box Clamp, foot operated.

**CLAMP CARRIERS**
Handy 18-sec., 5 ft. wide, 38" clamps per sec.

**DOVETAILERS**
Dodds 25 Spindle, motor driven, spiral gears.

**DOWEL MACHINERY**
Bell No. 4-A capacity ⅛"-2", M.D., B.B.
Bell No. 8 Auto. Gluer & Dowel Dr., Dir. M.D.
Nash No. 4 Dowel Rod Sander, motor driven

**JOINTERS**
Fay & Egan No. 217, Continuous Chain Feed
Jenkins No. 3CD, Continuous Chain Feed, B.B., D.M.D.
American 12", Round Head, motor driven
Superior 12", Round Head, motor driven

**JIG SAWS**
American, self-contained
Oliver No. 173 Self-contained, D.M.D.
Superior, Self-contained, motor driven

**MORTISERS**
Greenlee No. 228 Vert., Hollow Chisel, M.D.

**MOULDERS**
American No. 1, 4", 4-Side, Motor Driven
American No. 1, 6", 4-Side, Motor Driven
American No. 33, 7", 4-Side, All Electric, B.B.
Houston, 10", 4-side
Mattison No. 262, 6", 4-Side All Electric B.B.

**PLANERS**
Superior 28" Single, Motor Driven
Buss No. 4, 30" sgl. cabinet, M.D.
American No. 112, 30" single, motor driven

**ROUTERS**
Porter No. 502, 2-spdl., B.B., D.M.D.

**SANDERS**
43" H.B. Smith, 3-Drum Endless Bed, D.M.D.
American No. 2, 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Mattison No. 138 Hand Block Belt, Motor Driven
Nash No. 4 Round Stock and Dowel Sander

**SHAPERS**
Onsrud W125 72" Automatic, multiple stations, B.B., direct motor driven, with frequency changer
Buss, Sgl. Spdl., Hi-Speed D.M.D., B.B.

**SAWS—CUT-OFF**
Buss Double End, Motor Driven
Racine Floor Type—motor driven
Fay & Egan Double End, Motor Driven.

**SAWS—RIP**
American No. 15 Chain Feed, motor driven
American No. 40 Chain Feed, Ballbearing, D.M.D.
Defiance No. 21-D Chain Feed—motor driven
Mattison No. 207, Chain Feed, Direct Motor Dr.

**SAWS—VARIETY**
Dodds Tilting Table, Motor Driven
Pettingell, Tilt Arbor, Roller Table, M.D.

**TENONERS**
American, Single End, Tenon Heads, M.D.
McKnight No. 71C Chair Back Tenoner, M.D.
Towsley Single End, Tenon heads, lower cope, cut off saw, motor driven

**VENEER MACHINERY**
Black Bros. No. 115 36"x84" Electric Press, Direct Motor Driven
Dennis Continuous Feed Veneer Jointer, mtr. driven
Dennis Veneer Taping Machine Motor Driven
Jenkins-Falls Veneer Jointer, B.B., motor driven

**MISCELLANEOUS**
Autenailer, Floor Type, Direct Motor Driven, B.B.
Bell No. 13 Dovetail Gluer.
Bell No. 56 Hand Feed Chucking Machine, Ballbearing Direct Motor Driven
Zoller Power Mitre Chopper, motor driven
Fay & Egan No. 253, Automatic Knife Grinder, 30"
Sturtevant 36" B.B. Blower M.D.

FADER REBUILT MACHINERY

FADER WOODWORKING EQUIPMENT QUALITY

## A. L. FADER & COMPANY
605 W. Washington Blvd., Chicago 6, Ill., Phone STate 2-7634

# Guaranteed Used Machinery

Band Saw Angling Ship Saw Fay & Egan No. 311 with 20 HP motor new as used price extra blades and parts
Band Saw, 20" Crescent M.D., New
Band Saw, New Northfield 20" ball bearing
Borer, Door Stile, Wilkins-Challoner.
Boring Machine Oliver Vert. sgl. spdle. D.M.D.
Chucking Machine, Smith, 3 HP motor
Door clamp, J.A. Fay & Co. 8x4"
Jointer, 24" Crescent, Belt Drive
Jointer 12" Hall & Brown with motor
Knife Grinder, auto Rogers style F-32"
Lathe, Auto. Berlin with heads, B.D.
Lathe, Propeller Fahlin 10' motor drive with wood patterns and jigs
Lathe, Waymouth, Automatic
Mortiser, Crescent Hollow Chisel, New
Mortiser, hollow chisel No. 379 Fay & Egan.
Moulder 12" American No. 505 babbitt bear. B.D.
Planer single Fay & Egan 24x6 with 5 HP single phase motor
Planer sgl. 16x6" Powermatic with 3 ph. motor used
Planer, New Powermatic 12x4" M.D.
Planer, single 16x6" Powermatic, New
Planer, single 24x6 Northfield No. 3, New
Planer, Crescent No. P-24-24x8 M.D. New.
Planer, 12x4" Boice Crane No. 1002, New
Radial Saws, New Multiplex No. 20A-30A & 40A Heads with holders and knives for automatic turning lathe
Router, Onsrud & Air Radial Arm with Frequency Changer
Sander, Crescent 18" Disc, New
Sander, Belt, Auto., Curtis 6'
Sander, Disc and Drum, Fay & Egan
Sander, Nash auto. belt for Bowling Pins
Sander, Belt 8' Schimmel Reid Semi Auto.
Saw, 12" tilt arbor, Dara-James New
Saw Scroll, F&E Self Combined, 36" throat.
Saw Table, American No. 20, Double Arbor
Saw, Swing, H. & A. No. 5—10", New
Saw, Swing, H. & A. No. 25—14", New
Saw, Swing, H. & A. No. 55—16", New
Saw, Variety, Hall & Brown No. 131 with motor
Saw, Variety Sidney tilt table
Shaper dble spdle Whitney with frequency changer
Shaper, Double Spindle Fay & Egan No. 265, belt drive with idler countershaft.
Shaper, American No. 20 with 2—5 HP motors
Tenoner, Hall & Brown No. 51 with copes
Tenoner, single end American No. 2½ with copes and cut-off and 7½ HP motor V-belt drive.
Tenoner, single end Hall & Brown No. 55 with copes and cut-off, belt drive

*Send us your inquiries for machines not listed*

## McDONALD MACHINERY CO.

**1531-35 N. Broadway  Ph. Central 9360  St. Louis 6, Mo.**



# GUARANTEED BY GAYNES

**BORERS**
2 Spindle Radial, 1-10", 1-18" Cap., Motorized.
Greenlee No. 369 Vertical, 5' Cap. B.B., M.D.

**BOX EQUIPMENT**
Morgan 9 Track nailer, C.B. with clincher
Morgan 16 Track nailer, O.B., with clincher
Morgan 18 Track nailer, O.B., with clinsher
C & D 24" Two color Printer, M.D.
Saranac Single Head Fastener, M.D.
Morgan 4 roll Matcher, M.D.

**CLAMPS AND CLAMP CARRIERS**
Handy Case Clamp, 48" Cap.
Taylor 30 section Clamp Carrier, 6'6" ap.

**FACER**
Smith 24" B.—B., D.M.D., separate feed motor.

**FACTORY TRUCKS**
36"x60"—6 wheel trucks.

**JOINTERS**
6", 12", 16", 24" plain and ball bearing.
Yates No. 213 Glue Jointer, B.B., D.M.D.

**LATHES**
Smith B42, B.B., Automatic Turning, M.D.

**MORTISERS**
Loeffler No. 609 motor driven.
New Britain No. 2 Chain, M.D.
New Britain No. 7 Chain M.D.

**MOULDERS**
Mattison No. 272, 6", B.B., D.M.D., all elect.

**PLANERS**
American 26" Single, Cabinet, B.B., coupled dr.
Whitney 30" Single, Cabinet, Plain Bear., M.D.
Smith 30" Single, Cabinet, B.B., B.M.D.
Whitney 30" Double, Cabinet, B.B., D.M.D.

**SANDERS**
Mattison No. 124—6'—Automatic Stroke, M.D.
Salem No. S3M, 42", Endless Bed, B.B., D.M.D.
Yates (Berlin) No. 431—43" Endless Bed, Spiral Drums, M.D.
F&E Horizontal, 14" Flat Belt, M.D.

**SAWS**
Yates American 36" Band Saw, B.B., D.M.D.
Tannewitz 42" Band Saw, D.M.D.
H & A No. 55 Swing Cut Off Saw, B.B., M.D.
Porter No. C-43 Cut Off Saw, B.B., D.M.D.
Mattison No. 244 Cut Off Saw, B.B., D.M.D.
Hermance No. 36 Chain Feed Rip Saw, D.M.D.
Mattison No. 207 Chain Feed Rip Saw, B.B., D.M.D.
Bell No. 12 Double Mitre Saw, B.B., D.M.D.
Northfield Variety Saw, tilting arbor, B.B., DMD
Buss Variety Saw, tilt table, B.B., D.M.D.
Radial Saws, 1½, 2 and 5 HP

**SHAPERS**
Sidney 2-spindle B.B., motorized
Smith 2-spindle, motorized.
Onsrud W227 Buck Shaper, B.B., D.M.D.
Onsrud W122, Automatic Shaper, B.B., D.M.D. with Frequency Changer

**TENONERS**
B & M Single End, Tenon Heads and Lower Cope Head.
Hayes Single End, Tenon Heads, Upper & Lower cope spindles and cut-off, M.D.

**MISCELLANEOUS**
Motors, Blowers, Band Saw Filers, Grinders, Hogs

## GAYNES ENGINEERING COMPANY

**1711-17 W. LAKE STREET  CHICAGO 12, ILLINOIS  PHONE: HAymarket 1-3061**

## "If it's for Woodworking . . . We Have It"

**BAND SAWS:** Walker Turner 14" B. B. M.C.
American 24"
Crescent 20" Ball Br. New
Crescent 26" Belt or M.D.
Lehman 30" Bab. Br. $125.00
Wright 20"
Crescent 36" Ball Br. Vee Motor Dr.
Crescent 36" Ball Br. D.M.D.
Fay & Egan No. 345 36"
Fay & Egan 48" Belt or Motor Dr.
Fay & Egan No. 155 20" Ball Br. M.D.
Moak 36" B. B. Band Saws (2)

**BAND RESAWS**
Yates V-4 60" Vert. M.D.
American 40" Ball Br.

**BORING MACHINES:** Fay & Egan No. 190 Sgl. Spl. Vert.
Andrews 32" Dbl. Col.
Andrews 42" Sgl. Col.
Root Sgl. Spl. Motor on Spl.
Dennis Sgl. Vert. Universal
Greenlee Post Borer

**BOX MAKERS MACHINERY:**
Beach Box Maker Carriage Cut Off
Hall & Brown Box Board Matcher
Luther Box Board Matcher

**CLAMP CARRIER:** Handy 12 ft. 6 wheel 18 leaves 6—31" clamps each 95% New

**CLAMPING MACHINERY:** American fig. 8853 8 ft. x 4½ ft. Door Clamp
American Comb. Sash & Door Clamp
Rowley & Hermance Door Clamp 3½ x 8 ft.
Lancaster Pneumatic Chair Clamp
Handy No. 100 Bed Clamp
Black Bros. Chain Clamps
American Q. A. Sash Clamp
3000 Spring Clamps No. 2 and No. 3

**DADO SAWS:** Fay & Egan No. 5 C O and Dado Saw
American No. 1 Dado Saw Auto.
Hall & Brown No. 134 Comb. C. O. & Dado Saw, Power Feed

**CUT OFF SAWS:** Oliver No. 94-D St. Line C O Saw with Roller Tables 95% New
Greenlee No. 453 Auto. Railway C.O. 7" cap
Greenlee No. 456 Auto. Railway C.O. 12" cap
Comet Timber C. O. 10 h.p. 41" blade
Beach Carriage C.O. Saw
Swing Cut Off Saws (several)
Fay & Egan Table C. O. Saw

**DOWEL MACHINES:** Fay & Egan No. 406 Rod Machine

**JIG SAWS:** Oliver No. 173-B Ball Br. Self Contained Motor built in. New at Bargain Price
Beach No. 1 Tilting Table Scroll Saw

**JOINTERS:**
Cordesman 9" Rd. Hd. Jointer
12" 4 knife Rd. Hd. Jointer
16" Fay & Egan No. 216 B.B. M.D.
16" American B.B. 4 knife Motor Dr.
Smith 18" 4 knife Jointer
Fay & Egan 20" rd. hd. Jointer
Fay & Egan No. 316 20" Rd. Hd. M.D.
Northfield (Late) 12" B.B. Motor on Hd
Fay & Egan 24" No. 115 Belt or Motor Dr.
Moak 12" B. B. Jointer M. D.

**LATHE:** Oliver 12"x5 ft. Sgl. Ph. Motor Head-stock 24" sw. 7 ft. Iron Bed Pattern w/Hand Fd. Carr. M.D.
Wood Lathe Sets 12" to 24" swing

**MORTISERS:**
New Britain No. 4 Chain with H. C. Attach
New Britain No. 7 Chain, Compound Table M.D.
New Britain No. 1 Chain Mortiser
Wysong & Miles No. 134 H. C. Auto. Feed
Colladay Vert. H. C. Motor on spdl. B.B
American No. 20 H.C. Comp. Table M.D.
American H C. Horizontal Auto. Feed
Crescent Hollow Chisel Mortiser

**MOULDERS:**
American No. 26-A 12"
American No. 3 Heavy 6" 4 side
Fay & Egan No. 207 7" 4 side
Hermance No. 50 8" 4 side Bab.
Hermance 10" 4 side
Fay & Egan No. 184 12" 4 side
Fay & Egan 10" 4 s.

**NAILING MACHINES:**
Grammes 4 track Cigar Box Nailer
Doig 2 track Cigar Box Nailer
Doig 3 track Close Back Nailer

**PLANERS—DOUBLE:**
Berlin No. 177 30"x12" $750.00
American 26"x8" Double
American No. 4½ 30"x7" Dlv. Roll
Whitney P-6 30"x7" Double Rd. Hd
Sect. R. & C. B.

**PLANERS—SINGLE:**
Whitney 30"x7" Sgl. Rd. Hd., Electric
Crescent No. 224 24"x6" Feed M.D.
Fay & Egan No. 2 24"x6"
American No. 1 20"x6"
L. Power 24"x6" Motor coupled Head
Powermatic 12"x4" M.D.

**RADIAL SAWS:**
Comet 1½ hp., 1 ph., 95% new

**NEW MULTIPLEX RADIAL SAWS IN STOCK**
No. 26-A ½ hp. single ph.
No. 30-A ¾ hp. single ph.
No. 40-A 1½ hp. single ph.
No. 50-A 5 hp., 3 ph.

**RIP SAWS:**
Falls No. 103 St. Line B. B. 15 hp. motor
Falls No. 103 St. Line B. B. Belt Dr.
Greenlee No. 427 Self Feed
Greenlee No. 429 Self Feed 12" cap.
Bel-Saw Gang Self Feed

**ROUTERS:**
Kelley Elect. Stair Router 3 ph.
Cincinnati Elect. Stair Router
Hunter Elect. Stair Router $100.00
Duro Elect. Floor Type
Portable 1 hp. and 2 hp. New

**SASH COPERS:**
American Foot Power Sash Coper
Electric Bench Type Sash Coper

**SAW FILING MACHINERY:**
Foley Band Saw Filer
Wardwell Band Saw Filer
Covel Resaw 4" Tension Rolls
Power Band Saw Setter

**SAW TABLES**
Oliver No. 80 D.M.D.
Yates-Amer. No. 0 Variety Motor Arbor
Crescent No. 2, 3, and 5 Universal

**SANDERS:**
Amer-Col. 42" 3 dr.
American No. 15 24" single dr. Hand Feed
American No. 15 20" single dr. Hand Feed
Mattison No. 115 Variety Belt Sander
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Double Spindle B. B. Motors on spindle 3600 or 7200 rpm.

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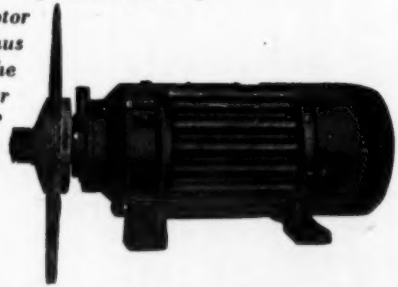

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Moulder, electric, Mattison No. 226, 12"
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Sander, 3-dr., Berlin 30", 4 motors
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Oliver No. 258T Double Spdl. short belted M.D.
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Smith No. 480 49" 3 drum End. Bed
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Fay & Egan 30" drum roll-feed
Buss 2-spindle vertical, oscillating belt drive
Wysong & Miles No. 164 universal belt, m.d.
Yates No. 421, 49-in. 6 drum with motors

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Tannewitz tilt table motor on arbor
Wallace 8" tilting arbor 1 HP 1 ph. motor
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Buss double cabinet type, motor-drive

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Yates G77 chain-feed, D.M.D.
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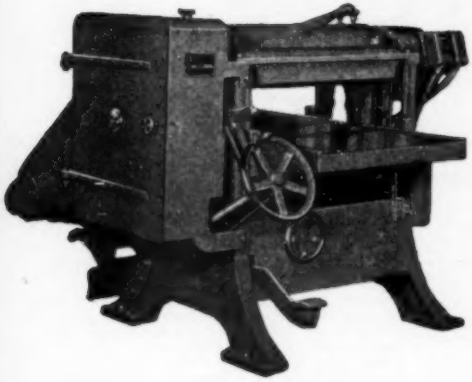

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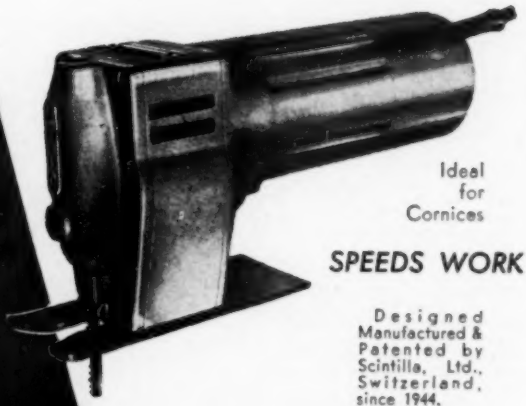

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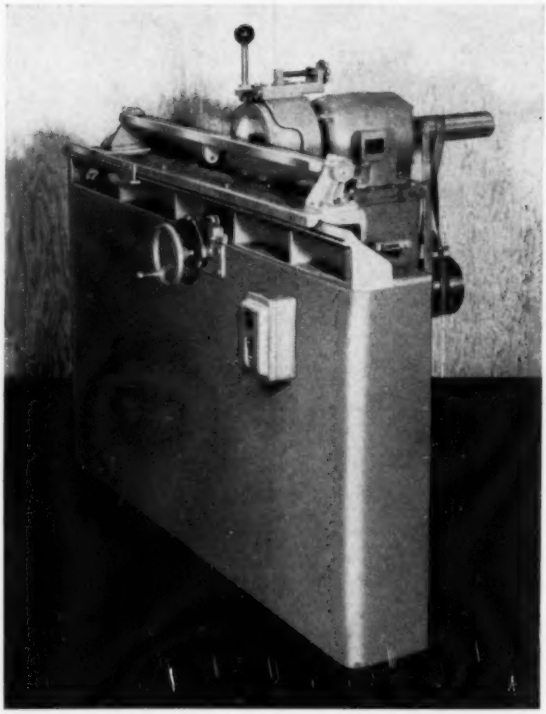

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